

# Chemical and Environmental Measurement Information Recra LabNet Philadelphia DMC Analytical Report

Client: TNU-HANFORD B99-078

**RFW#**: 9909L166

SDG/SAF #: H0541/B99-078

W.O. #: 10985-001-001-9999-00

Date Received: 09-23-99

### GC/MS VOLATILE

One (1) soil sample was collected on 09-21-99.

The sample and its associated QC samples were analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8260A for TCL Volatile target compounds on 10-01-99.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

- 1. The cooler temperature upon receipt has been recorded on the chain-of-custody.
- 2. The required holding time for analysis was met.
- 3. Non-target compounds were not detected in the sample.
- 4. All surrogate recoveries were within EPA QC limits.
- 5. All matrix spike recoveries were within EPA QC limits.
- All blank spike recoveries were within EPA QC limits. 6.
- 7. The method blank contained the common laboratory contaminant Methylene Chloride and the target compound 2-Butanone at levels less than the CRQL.

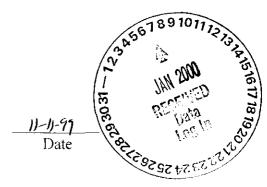
J. Michael Taylor

Vice President

Philadelphia Analytical Laboratory

som\group\data\voa\tnu09166.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 8 pages.



### **GLOSSARY OF VOA DATA**

### **DATA QUALIFIERS**

U	=	Compound was analyzed for but not detected. The associated numerical value is the estimated
		sample quantitation limit which is included and corrected for dilution and percent moisture.

- J = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
- E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- **D** = Identifies all compounds identified in an analysis at a secondary dilution factor.
- 1 = interference.
- NQ = Result qualitatively confirmed but not able to quantify.
- N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
- This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
- Y = Additional qualifiers used as required are explained in the case narrative.

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### **GLOSSARY OF VOA DATA**

### **ABBREVIATIONS**

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions
		and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

**DL** = Suffix added to sample number to indicate that results are from a diluted analysis.

NA = Not Applicable.

**DF** = Dilution Factor.

NR = Not Required.

SP, Z = Indicates Spiked Compound.

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### Recra LabNet - Lionville Laboratory

Volatiles by GC/MS, HSL List

Report Date: 11/04/99 16:44 Client: TNU-HANFORD B99-078 Work Order: 10985001001 Page: 1a RFW Batch Number: 9909L166

	Cust ID:	BOWBT:	3	BOWBT	3	BOWBT	3	VBLKUV		VBLKUV BS		
Sample Information	RFW#: Matrix: D.F.: Units:	00: SOIL 1.0 UG/	00	001 M SOIL 1.0 UG/I	02	001 MSI SOIL 1.0 UG/F	02	99LVN322-A SOIL 1.0 UG/A	00	99LVN322-1 SOIL 1.0 UG/F	00	
	Toluene-d8	106		102		100		101	ુ	102		
Surrogate Br	romofluorobenzene	101	96	97	9/0	106 100	oto oto	98	%	98	oto oto	
3	Dichloroethane-d4	101	%	98	0/0	106	%	78	%	79	o oto	
<del>-</del>	=======================================							_			-	======================================
		10	Ü		U	11		10	Ü	10		
Bromomethane			Ū		Ü		Ū	10	Ü	10	U	
Vinvl Chloride		10	Ū	11	Ū	11	_	10	Ū	10	-	
Chloroethane		10	Ü		Ü		Ū		Ū	10	Ū	
Methylene Chlorid	le	8	В	10	В	9	В	2	J	2	JВ	
Acetone		7	J	5	J	4	J	10	Ū	10	Ū	
Carbon Disulfide		5	U	6	U	6	U	5	U	5	U	
1,1-Dichloroether	ne	5	Ŭ	98	%	98	%	5	U	97	%	
1,1-Dichloroethan	ne	5	U	6	U	6	U	5	U	5	U	
1,2-Dichloroether	ne (total)	5	U	6	U	6	U	5	U	5	U	
Chloroform		5	U	6	U	6	U	5	U	5	U	
1,2-Dichloroethan	ne	5	U	6	U	6	U	5	U	5	U	
2-Butanone		3	JB	2	JB	2	JB	1	J	1	JB	
1,1,1-Trichloroet	hane	5	U	6	U	6	U	5	U	5	U	
Carbon Tetrachlor	ide	5	U	6	U	6	U	5	U	5	U	
Bromodichlorometh	nane	5	U	6	U	6	U	5	U	5	U	
1,2-Dichloropropa	ne	5	U	6	U	6	U	5	U	5	U	
cis-1,3-Dichlorop	ropene	5	U	6	U	6	U	5	U	5	U	
Trichloroethene		5	U	101	જ	105	%	5	U	97	96	
Dibromochlorometh	ane	5	U	6	U	6	U	5	U	5	U	
1,1,2-Trichloroet	hane	5	U	6	U	6	U	5	U	5	U	
Benzene		5	Ų	101	010	105	%	5	U	91	%	
Trans-1,3-Dichlor	opropene	5	U	6	U	6	U	5	U	5	U	
Bromoform		5	U	6	U	6	U	5	U	5	U	
4-Methyl-2-pentan	ione	10	U	11	U	11	U	10	U	10	U	
2-Hexanone		10	U	11	U	11	U	10	U	10	U	
Tetrachloroethene		5	U	6	U	6	U	5	U	5	U	
1,1,2,2-Tetrachlo	roethane	5	U	6	U	6	U	5	U	5	U	
Toluene		5	U	108	ato	112	ò	5	U	100	96	
* Outside of RDA	CID OC limite											

\*= Outside of EPA CLP QC limits.

pul 11-09-91

RFW Batch Number: 9909L	166 Cli	ent: TNU-	HANFO	RD B99-07	8	Work C	orde	r: 10985001	001	Page: 1h	2	n
	Cust ID:	BOWBT3		BOWBT3	}	BOWBTS	3	VBLKUV		VBLKUV BS	-	C
	RFW#:	001		001 MS	;	001 MSI	)	99LVN322-M	в1	99LVN322-N	B1	
Chlorobenzene		5	U	102	ે	106	્ક જ	5	Ū	98	96	
Ethylbenzene		5	Ü	6	U	6	U	5	U	5	U	
Styrene		5	U	6	U	6	U	5	U	5	U	
Xylene (total)		5	U	6	Ų	6	U	5	Ü	5	U	

<sup>\*=</sup> Outside of EPA CLP QC limits.

# Recra LabNet - Lionville Laboratory VOA ANALYTICAL DATA PACKAGE FOR TNU-HANFORD B99-078

DATE RECEIVED: 09/23/99

RFW LOT # :9909L166

CLIENT ID	RFW	#	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOWBT3	001		s	99LVN322	09/21/99	N/A	10/01/99
BOWBT3	001	MS	S	99LVN322	09/21/99	N/A	10/01/99
BOWBT3	001	MSD	S	99LVN322	09/21/99	N/A	10/01/99
LAB QC:							
VBLKUV	MB1		s	99LVN322	Ŋ/A	N/A	10/01/99
VBLKUV	MB1	BS	s	99LVN322	N/A	N/A	10/01/99

AU 10879

RECRA Lab			Custo	ody T								rk as	Re	equ ) Mu	ies ta	<b>t</b> Pa	age_	<b></b> _0	<u> </u>	-			<b>5</b>	REC Lab	:RĀ Net
Client -	-T-	. Hanfor	~ 6	399-0	13-8			Refrige	rator #		7	6-	7												
Est. Final Pro			- <del>(_)</del>	<del></del>	,,,,,			***	04-1	Llquid						_									
Project #\	998 <i>9</i>	5-001-00	1- 999	9-00				#/ гуре	Container	Solid	/BG	leci	-1				<u> </u>	LAG.				-1_			
Project Conta			1		<i>:</i>	·		Volume	1	Liquid											<u> </u>		į		
RECRA Proje	ct Man	ager _OT_				·				Solid	00 mi	<u>2</u> €000			<b> </b>			500mi	_				<del>  -                                   </del>	<del>                                     </del>	
ac Spice		Del_Stc	TAT	3	o de	ry.		Presen	vatives	<u> </u>	_	OBG	ANIC		-			INC	RG		┼			<del>                                     </del>	
Date Rec'd	3-2z	5.99	Date Due		0/23	<i>1</i> 99		ANALY REQUE		-	VOA	BNA	Pest/	Herb				Metal	S				!		
MATRIX	<u> </u>					Ma	trix							1		RE	CRA L	abNet	Use	Only	·	Ţ		<u>.</u>	
CODES:  S - Soll  SE - Sediment  SO - Solid  SL - Sludge	Lab ID		Client ID/Desc	ription		Cho (*	C sen /)	Matrix	Date Collected	Time Collected	H #2020	02025H	OSCO				Colo	Jex O	10N TO	1NH3N 1SFD	700/	1000 1000 1000 1000 1000 1000			
W - Water	~/ /~/	Bours	r3		' <u> </u>	X	X	S	921.99		~	~	X			_	X	V	X	X	X	X			
A - Air DS - Drum																									
Solids DL - Drum																									
Liquids L - EP/TCLP																									
Leachate WI - Wipe				:																					L
X - Other F - Fish	<u> </u>			· .																					
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Special instruct	ions:	0011000						nevision Net (	ns: 1) = Re 3	cra+	Be	, Cu	U, 7	ni,	V, č	2n		1)	mples : Shippe	were:		CO 1)	C Tap Preser	e was:	
Saf	<u>L</u> R	COMPOS WASTI 399-07	6 E -8						5	1/3/99 3B and TL a amples per		o all me	tals					Air 2) 3)	nd Deli bill # _ Ambier Receive	t on Ci	nilled	2)   Pac 3)	Jnbrok kage Presen	(Y) or den on C (Y) or t on Sal (Y) or	Outer N mple
Relinquished by		Received by	Date	Time	Rel	Inquis by	hed		6 Received by	D	ate	Tim	e		epancie			4) Pro	Labels operly F	Indicat Precerv o	e ed r N	Sar CO	nple <b>(</b> C Rec on San	en on ord Pres ople Red or	sent c't
Fed Ex	7	Throat	9-23-99	0945				O	RIGIN	TEN					Record				lding Ti			Cor Ter	-1	<u>5.5</u>	
					L			1170		· <del> / ·</del>		L		<u> </u>											

FED EX

Bechtel Hanford	Inc.	C	HAIN OF CUS	TODY/S	AMPL	E ANAL	YSIS	REQUES	T	В99	9-078-122	Page 1	of <u>1</u>	
Collector Bowers/Trice	·		pany Contact ris Cearlock	Telepho 372-9				Project Coord	inator	Price Code	8N	Data Tu	rnaround	
Project Designation 200 Area Source characteriza	tion - 200-CW-LOIL	Samp	oling Location 0 B pond (B8758) >15'					SAF No. B99-078				45	Days	
La Chart No.	74-068	Field	Logbook No.		<del></del>		i	Method of Shipment Fed Ex						
Shipped To TMARBERA D # 9-	81-99	Offsi	te Property No. A 990	Bill of Lading/Air Bill No. 4235 1952 9664 COA BZOGWI 6716										
	_!							COA B	1061	U167	16	· _ <del></del>		
POSSIBLE SAMPLE HAZAI	RDS/REMARKS		Preservation	Cool 4C	Cool 4C	None	Cool 40	:						
			Type of Container	aG	aG	aG	aG							
Special Handling and/or Store	pecial Handling and/or Storage			60mL	250mL	250mL	500mL							
	SAMPLE ANA	LYSIS		VOA - \$260A (TCL); VOA - \$260A (Add- On) (1- Propanol, Ethanol)	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (1) in Special Instructions.	See item (2) Special Instruction							
Sample No.	Matrix •	Sample Date	Sample Time			L.V.							The Control	
BOWBI2 A	Soil										·		<del></del>	
BOWBT3	Soil	9-31-49	1250	_X_	X	ļ	X			Dom CA)	ļ		ļ	
BOWBTA 1/3	Soil					<b> </b>			ļ	<u> </u>				
BOWETS G-21-99	Soil	<u> </u>						<del></del>	<b> </b>	<del></del> _				
CHAIN OF POSSESSION	6 Date/Time	Sign/Pri		de/Time	See ci analy:	ze for Np-237, i	comments isotopic U,	on SAF B99-078 Ni-63, Tech-99,	Tritium, . C	mma Spec, bottle out of ICP bottle Cyanide, and pH.	also	Matrix Soil Water	,	
Bong Bones 9-21-99/1610 Rof 18 9-21-99 Retinquished By Date Time Received By Chile 9/27/99 Retinquished By Date Time Received By FOREX				1630 He/Time	Gamn (Uran (2) IC	ia Spec - Add-c ium}; Isotopie P Metals - 601	on (Americ Plutonium; OA (Supert	ium-241); Stront Isotopic Thoriur race) (Arsenic, E	ium-89,90 n (Thorium- arium, Cadr	n-152, Europium Total Sr; Total C 232}; Americium nium, Chromium {Beryllium, Cop	Uranium n-241 n, Lead,	Vapor Other Solid Other Liquid		
College 9.7- Tellinguished By	7.99 14 60 Date/Time	Received By	F 9-22-59 Da	1400 te/Time 09115	Cou	lium, Zinc); Me	егсигу - 741	1 - (CV); Chron	ium Hex - 7	196		ate/Time		
LABORATORY Received By SECTION			J	Tid	c 									
FINAL SAMPLE Disposal Method DISPOSITION	hod					Dispos	ed By				. Di	ate/Time		



Chemical and Environmental Measurement Information

# Recra LabNet Philadelphia Analytical Report

Client: TNU-HANFORD B99-078

W.O. #:

**W.O.** #: 10985-001-001-9999-00

RFW#: 9909L166

Date Received: 09-23-99

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Date

SDG/SAF #: H0541/B99-078

### **SEMIVOLATILE**

One (1) soil sample was collected on 09-21-99.

The sample and its associated QC samples were extracted on 10-04-99 and analyzed according to criteria set forth in Recra OPs based on SW 846 Methods 8270B for TCL Semivolatile target compounds on 10-05-99.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

- 1. The cooler temperature upon receipt has been recorded on the chain-of-custody.
- 2. The required holding times for extraction and analysis were met.
- 3. Non-target compounds were detected in the sample.
- 4. All surrogate recoveries were within EPA QC limits.
- 5. All matrix spike recoveries were within EPA QC limits.
- 6. One (1) of eleven (11) blank spike recoveries was outside EPA QC limits.
- 7. The sample was spectrally searched for Butylated Hydroxytoluene; however, it was not identified in the sample.

J. Michael Taylor Vice President

Philadelphia Analytical Laboratory

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### **GLOSSARY OF BNA DATA**

#### DATA QUALIFIERS

U	=	Compound was analyzed for but not detected. The associated numerical value is the estimated
		sample quantitation limit which is included and corrected for dilution and percent moisture.

- Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TlCs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
- E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- **D** = Identifies all compounds identified in an analysis at a secondary dilution factor.
- I = Interference.
- NQ = Result qualitatively confirmed but not able to quantify.
- A = Indicates that a TIC is a suspected aldol-condensation product.
- N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
- This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
- Y = Additional qualifiers used as required are explained in the case narrative.

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### **GLOSSARY OF BNA DATA**

### **ABBREVIATIONS**

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

**DL** = Suffix added to sample number to indicate that results are from a diluted analysis.

NA = Not Applicable.

**DF** = Dilution Factor.

NR = Not Required.

SP, Z = Indicates Spiked Compound.

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03

Report Date: 10/31/99 16:02 • Client: TNU-HANFORD B99-078 Work Order: 10985001001 Page: 1a RFW Batch Number: 9909L166

-	Cust ID:	BOWBT3	3	BOWBT3	1	BOWBT3	3	SBLKDQ		SBLKDQ BS		
Sample	RFW#:	001	L	001 MS	5	001 MSE	)	99LE1196-N	ß1	99LE1196-M	181	
Information	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		
	D.F.:	1.0	00	1.0	0 (	1.0	0	1.0		1.0		
	Units:	UG/1	⟨G	UG/F	G	UG/K	(G	UG/F	(G	UG/k	(G	
	Nitrobenzene-d5	60	%	80	%	75	%	78	%	92	왕	
Surrogate	2-Fluorobiphenyl	58	%	78	%	73	%	78	%	94	%	
Recovery	Terphenyl-d14	71	%	92	%	85	%	92	8	104	%	
	Phenol-d5	61	%	78	8	75	%	81	96	94	%	
	2-Fluorophenol	60	ક	77	%	73	%	77	8	92	8	
	2.4.6-Tribromophenol	62	%	87	%	79	%	75	%	96	%	6.1
========											= <b>t</b>	=======================================
Phenol		350	U	73	ò	72	%	330	U	90	%	
	oethyl)ether	350	Ū	350	_	350		330	Ū	330	Ū	
2-Chlorophe	nol	350	Ū	73	૪	72	%	330	U	90	8	
1,3-Dichlor	obenzene	350	Ū	350			U	330	U	330	U	
1,4-Dichlor	obenzene	350	U	69	%	72	8	330	Ü	89	왕	
1,2-Dichlor	obenzene	350	U	350	-	350	U	330	Ü	330	U	
2-Methylphe		350	U	350			U	330	U	330	U	
2,2'-oxybis	(1-Chloropropane)	350	U	350		350	Ü	330	U	330	U	
4-Methylphe	nol	350	U	350		=	Ü	330	U	330	U	
N-Nitroso-d	i-n-propylamine	350	U	82	%	82	%	330	U	99	%	
Hexachloroe	thane	350	U	350		350	U	330	U	330	U	
Nitrobenzen	e	350	U	350		350	U	330	U	330	U	
Isophorone_		350	U	350	U	350	U	330	U	330	U	
2-Nitrophen	01	350	Ü	350			Ü	330	U	330	Ū	
2,4-Dimethy	lphenol	350	U	350		350	U	330	Ü	330	U	
bis(2-Chlor	oethoxy)methane	350	Ų	350	U	350	U	330	U	330	U	
2,4-Dichlor	ophenol	350	Ü	350		350	_	330	U	330	U	
1,2,4-Trich	lorobenzene	350	U	76	8	<b>7</b> 6	8	330	U	93	%	
Naphthalene		350	Ü	350	U	350	U	330	U	330	U	
	line	350	U	350	U	350	U	330	U	330	U	
Hexachlorob	outadiene	350	U	350			U	330	U	330	Ü	
4-Chloro-3-	methylphenol	350	U	80	%	76	%	330	U	92	ò	
	hthalene	350	U	350	U	350	U	330	U	330	U	
	yclopentadiene	350	U	350	U	350	U	330	U	330	Ü	
	lorophenol	350	U	350	U	350	U	330	U	330	U	
	lorophenol	880	U	880	U	880	U	840	U	840	U	

\*= Outside of EPA CLP QC limits.



RFW Batch Number: 9909L166 Client: TNU-HANFORD B99-078 Work Order: 10985001001 Page: 1b

RFW Batch Number: 9909L166	Client: INU	<u>-HANFORD B99-07</u>	o wo	<u>rk Order: 1098:</u>	001001	Page: ID
Cust ID:	BOWBT3	BOWBT3	BOWBT3	SBLKDQ	SBLKDQ BS	
RFW#:	001	001 MS	001 MSD	99LE1196-MB1	99LE1196-MB1	
2-Chloronaphthalene	350 U	350 U	350 U	330 U	330 U	
2-Nitroaniline	880 U	880 U	880 U	840 U	840 U	
Dimethylphthalate	350 U	350 U	350 U	330 U	330 U	
Acenaphthylene	350 U	350 U	350 U	330 U	330 U	
2,6-Dinitrotoluene	350 U	350 U	350 U	330 U	330 U	
3-Nitroaniline		880 U	880 U	840 U	840 U	
Acenaphthene	350 U	81 %	78 %	330 U	97 %	
2,4-Dinitrophenol	880 U	880 U	880 U	840 U	840 U	
4-Nitrophenol	880 U	82 %	74 %	840 U	87 %	
Dibenzofuran	350 U	350 บ	350 U	330 U	330 U	
2,4-Dinitrotoluene	350 U	85 %	80 %	330 U	98 * %	
Diethylphthalate	350 U	350 U	350 U	330 U	330 U	
4-Chlorophenyl-phenylether	350 U	350 U	350 U	330 U	330 U	
Fluorene	350 U	350 U	350 U	330 U	330 U	
Fluorene	880 U	880 U	880 U	840 U	840 U	
1,6-Dinitro-2-methylphenol	880 U	880 U	880 U		840 U	
N-Nitrosodiphenylamine (1)	350 U	350 U	350 U		330 U	
-Bromophenvl-phenvlether	350 U	350 U	350 U		330 U	
4-Bromophenyl-phenylether	350 U	350 U	350 U		330 U	
Pentachlorophenol	880 U	89 %	76 %		94 %	
Phenanthrene	350 U	350 U	350 U	330 U	330 U	
Anthracene		350 U	350 U		330 U	
Carbazole	350 U	350 U	350 U		330 U	
Di-n-butylphthalate	350 U	350 U	350 U	330 U	330 U	
Fluoranthene		350 U	350 U	330 U	330 U	
Pyrene	350 U	90 %	87 %	330 Ü	104 왕	
Butylbenzylphthalate	350 U	350 U	350 U	330 U	330 U	
3,3'-Dichlorobenzidine	350 U	350 U	350 U	330 U	330 U	
Benzo(a)anthracene	350 U	350 U	350 U 350 U	330 U	330 U	
Chrysene	350 U	350 U	350 U		330 U	
Chrysene	350 U	350 U	350 U	330 U	330 U	
Di-n-octyl phthalate		350 U			330 U	
Benzo(b)fluoranthene	350 U	350 U	350 U 350 U	330 U	330 U	
Benzo(k)fluoranthene	350 U	350 U	350 U		330 U	
Benzo(a)pyrene		350 U	350 II	330 []	330 U	
Indeno(1,2,3-cd)pyrene	350 U	350 U	350 U	330 U	330 U	
Dibenz(a,h)anthracene	350 U	350 U	350 U	330 U	330 U	
Benzo(g,h,i)perylene	350 U	350 U	350 U		330 U	

(1) - Cannot be separated from Diphenylamine. \*= Outside of EPA CLP QC limits.

CLIENT SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

١		 
i	BOWBT3	
!	BOWEIS	
1		

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-078

Lab Sample ID: 9909L166-001 Matrix: (soil/water) <u>SOIL</u>

Sample wt/vol: 30.0 (g/mL)  $\underline{G}$ Lab File ID: D100507

Level: (low/med) LOW Date Received: 09/23/99

% Moisture: 5 decanted: (Y/N) Date Extracted: 10/04/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: <u>10/05/99</u>

Dilution Factor: 1.00 Injection Volume: 2.0(uL)

GPC Cleanup: (Y/N) N pH: \_\_\_\_

CONCENTRATION UNITS: Number TICs found: 2 (ug/L or ug/Kg) <u>UG/KG</u>

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	=======================================	=		=====
1.	UNKNOWN	8.48	90	JB
2.	ALDOL CONDENSATE	9.02	70	JA
		1		I

### 1F SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

ļ		
SBLKDQ		
1		

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-078

Matrix: (soil/water) <u>SOIL</u> Lab Sample ID: 99LE1196-MB1

Sample wt/vol: 30.0 (g/mL)  $\underline{G}$ Lab File ID: <u>D100505</u>

Level: (low/med) LOW Date Received: <u>10/04/99</u>

% Moisture: \_\_\_\_\_ decanted: (Y/N)\_\_ Date Extracted: 10/04/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 10/05/99

Injection Volume: 2.0(uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N)  $\underline{\mathtt{N}}$ pH: \_\_\_\_ CONCENTRATION UNITS:

Number TICs found: 1 (ug/L or ug/Kg) UG/KG

CAS	NUMBER	COMPOUND	NAME	RT	EST. CONC.	Q
======		=======================================				=====
1.		UNKNOWN		8.48	80	J
						i i

# Recra LabNet - Lionville Laboratory BNA ANALYTICAL DATA PACKAGE FOR TNU-HANFORD B99-078

DATE RECEIVED: 09/23/99 RFW LOT # :9909L166

CLIENT ID	RFW	#	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
						· · · · · · · · · · · · · · · · · · ·	
BCWBT3	001		S	99LE1196	09/21/99	10/04/99	10/05/99
BCWBT3	001	MS	S	99LE1196	09/21/99	10/04/99	10/05/99
BCWBT3	001	MSD	S	99LE1196	09/21/99	10/04/99	10/05/99
LAB QC:							
SBLKDO	MB1		S	99LE1196	N/A	10/04/99	10/05/99
SBLKDQ	MB1	BS	S	99LE1196	N/A	10/04/99	10/05/99
C 0 2 1 1 5 2			~	JJEE 1 1 3 0	/	20/02/33	20/05/55

RECRA LabNet Use Only

9909L166

# Custody Transfer Record/Lab Work Request Page \_\_\_ of \_\_\_

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS



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SE - Sediment SO - Solid											200	200	020			2	les	35	SHS	PA	10,000			
SL - Sludge W - Water			<del></del>			MS	MSD	^			00	00				1	<u> </u>	1	1	17/	ichox			
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Bechtel Hanford Inc.	C	HAIN OF CUST	TODY/S	AMPLI	EANAL	YSIS	REQUES	r	<b>B9</b> 9	9-078-122	Page 1	of 1
Collector  Bowers/Trice		any Contact is Cearlock	Telepho 372-9		<del></del>		Project Coordi TRENT; SJ	nator	Price Code	8N	Data Tu	rnaround
Project Designation 200 Area Source characterization - 200-CW-1 OU	Samp	ling Location B pond (B8758) >15'			<del></del>		SAF No. B99-078				45	Days
ice Chest No. ERC 94-06		Logbook No.				ſ	Method of Ship Fed Ex					
Shipped To TMARECRA D # 9-31-99		e Property No. A 990	266	2			Bill of Lading/	Air Bill N	1952	ale L	, ·- (	
			<del>_</del>	·			COA BD	064	U/67	/ _		** 1
POSSIBLE SAMPLE HAZARDS/REMARKS		Preservation	Cool 4C	Cool 4C	None	Cool 40	0					
		Type of Container	aG	aG	аG	aG						
		No. of Container(s)	1	1	1	'			1			{
Special Handling and/or Storage		Volume	60mL	250mL	250mL	500mL		}	}	}	}	
SAMPLE ANA	Lysis		VOA - 8260A (TCL); VOA - 8260A (Add- On) (1- Propendi, Ethanol)	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs • 8082	See item (1) in Special Instructions	See item (2 Special Instruction						
Sample No. 16 199 Matrix *	Sample Date	Sample Time										
Soil Soil												
Soil .	9-21-29	1250	χ_	X		X			Domcal		1	ļ
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CHAIN OF POSSESSION  clinquished By 0 45 10 4 1 10 10 10 10 10 10 10 10 10 10 10 10 1	Received By FE Received By CT	18 9.21.19 9/27/99 DFM-22.99	te/Time  1000  te/Time  1400  te/Time  oqus  Titl	See chanalyz	te for Np-237, te for NO2/NO amma Spectros ta Spec - Add- tium}; Isotopio P Metals - 601 pum, Silver); IC tium, Zinc); Mi	comments isotopic U, 3, IC anion of the copy {Ces on (Americ Plutonium; 0A (Super Plutonium;	IS on SAF B99-078, Ni-63, Tech-99, is, Sulfides, Amm imm-137, Cobalt-Cium-241}; Stronti; Isotopic Thorium trace) (Arsenic, B 6010A (Supertrac 71 - (CV); Chrom	Fritium, Conia, Total ( 60, Europium um-89,90 1 (Thorium- arium, Cadr te Add-On) ium Hex - 7	Out of ICP bottle Cyanide, and pH. n-152, Europium • Total Sr; Total I 232); Americium (Beryllium, Copi 196	also -155}; Uranium -241 , Lead, per, Nickel,	Matrix Soil Water Vapor Other Solid Other Liquid	
INAL SAMPLE Disposal Method					Dispos	ed By					Date/Time	ļ



Chemical and Environmental Measurement Information

# Recra LabNet Philadelphia Analytical Report

Client: TNU-HANFORD B99-078

**W.O** #: 10985-001-001-9999-00

Date

RFW#: 9909L166

Date Received: 09-22-99

SDG/SAF#: H0541/B99-078

### DIESEL RANGE ORGANICS

One (1) soil sample was collected on 09-21-99.

The sample and its associated QC samples were prepared on 10-04-99 and analyzed by methodology based on EPA Method 8015B for Diesel Range Petroleum Hydrocarbons on 10-08-99. The analysis met the intent of method WTPH-D.

- 1. The cooler temperature has been recorded on the chain-of-custody.
- 2. All required holding times for extraction and analysis were met.
- 3. All initial calibrations associated with this data set were within acceptance criteria.
- 4. All diesel continuing calibration standards analyzed prior to the sample extracts were within acceptance criteria.
- 5. All surrogate recoveries were within acceptance criteria.
- 6. The blank spike recovery was within acceptance criteria.
- 7. All matrix spike recoveries were within acceptance criteria.

7.36.5678970777231415767 JAN 2000

RECEIVED

Data

Log In

Log In

J. Michael Taylor

Vice President

Philadelphia Analytical Laboratory

R:\SHARE\LC\GCSCAN\09-166d.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 6 pages.

001

## GLOSSARY OF DIESEL DATA

## DATA OUALIFIERS

- U = Indicates that the compound was analyzed for but not detected.

  The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).
- J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.
- E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- I = Interference.

### **ABBREVIATIONS**

- BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.
- BSD = Indicates blank spike duplicate.
- MS = Indicates matrix spike.
- MSD = Indicates matrix spike duplicate.
- DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.
- NA = Not Applicable.
- DF = Dilution Factor.
- NR = Not Required.
- SP = Indicates spiked compound.

#### Recra LabNet - Lionville Laboratory

DIESEL RANGE ORGANICS BY GC

Report Date: 10/13/99 07:11

Work Order: 10985-001-001-9999-00 Page: 1 RFW Batch Number: 9909L166 Client: TNU-HANFORD B99-078  $\mathfrak{C}$ 00 Cust ID: BOWBT3 BLK BS BOWBT3 BOWBT3 BLK Sample RFW#: 001 MSD 99LE1192-MB1 99LE1192-MB1 001 001 MS Information Matrix: SOIL SOIL SOIL SOIL SOIL D.F.: 1.00 1.00 1.00 1.00 1.00 Units: mg/kg mg/kg mq/kg mq/kq mq/kq Surrogate: p-Terphenyl 96 % 98 62 107 106 Diesel Range Organics \_\_\_\_\_ 4.1 U 95 2 86 4.0 U 84

March Olyphan

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not requested. NS= Not spiked. S= Percent recovery. D= Diluted out. S= Interference. S= Not Applicable. S= Outside of Advisory limits.

# Recra LabNet - Lionville Laboratory DRO ANALYTICAL DATA PACKAGE FOR TNU-HANFORD B99-078

DATE RECEIVED: 09/23/99 RFW LOT # :9909L166

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOWBT3	001	s	99LE1192	09/21/99	10/04/99	10/08/99
BOWBT3	001 MS	S	99LE1192	09/21/99	10/04/99	10/08/99
BOWBT3	001 MSD	S	99LE1192	09/21/99	10/04/99	10/08/99
LAB QC:						
BLK	MB1	S	99LE1192	N/A	10/04/99	10/08/99
BLK	MB1 BS	S	99LE11 <b>92</b>	N/A	10/04/99	10/08/99



RECRA LabNet Use Only

99091166

# Custody Transfer Record/Lab Work Request Page \_\_\_ of \_\_\_\_



FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client	TP\1	Hanfor	7	399-0	178		R	efriger	ator#	<del></del>	1	6-													
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Project Conta										Liquid		,													
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												ORG	ANIC	·					PIG	]					-
Date Rec'd	7-53	99.6	Date Due		10/62	99		NALYS		-	δ V	BNA	Pest/ PCB	Herb	} .			Metal	S	ļ	•		<b>\</b>	j	
Account #	<del></del>	<del></del>			<del></del>		<del>-</del>		<del>, ,</del>			<u> </u>	9.0	<u>                                     </u>	<u> </u>	DEC	204	_abNet	<u> </u>	<u> </u>		<u> </u>	<u></u>	<u></u>	<u></u>
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SE - Sediment SO - Solid	,,,	1			1				Conected	Conected	36	200	0800				\$	En	1000	NHS	9	1CNO	'	į	
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Bechtel Hanford	Inc.		CI	HAIN OF CUS	rody/s	AMPLI	E ANAL	YSIS	REQUES	$\Gamma$	B99	)-07 <b>8-</b> 122	Page 1	of <u>1</u>
Collector Bowers/Trice		<del></del>	Compa	eny Contact is Cearlock	Telepho 372-9				Project Coordi TRENT, SJ	nator	Price Code	8N	Data Tu	rnaround
Project Designation 200 Area Source characteriza	tion - 200-CW-1 OU		Sample	ing Location B pond (B8758) >15'			<del></del>		SAF No. B99-078	{			45	Days
Ice Chest No. FRC	710-0108	<del></del>		Log book No.	<del></del>				Method of Ship Fed Ex	ment				90
Shipped To TMARRECRA D FD 9-	74-063 31-99			Property No. A 990	266	7			Bill of Lading/	Air Bill No	952	966	orf	<del>_</del>
								}	COA BD	ocu	167	/C		; 
POSSIBLE SAMPLE HAZAI	RDS/REMARKS			Preservation	Cool 4C	Cool 4C	None	Cool 40	:					
				Type of Container	aG	аG	aG	aG						
			}	No. of Container(s)	1	, , ,	1	1						
Special Handling and/or Stor	age		{	Volume	60mL	250mL	250mL	500mL	<b>,</b>			<b> </b>		ł
	SAMPLE ANAL	.YSIS			VOA - 8260A (TCL); VOA - 8260A (Add- On) (1- Propanol, Ethanol)	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (1) in Special Instructions.	See item (2 Special Instruction	1					
Sample No.	Matrix •	Sampl	e Date	Sample Time										
BOWBT2	Soil													
BOWBT3	Soil	9-2	1-79	1250	X_	<u>X</u>		<u> </u>			Dom CA)		<u> </u>	
BOWBTA 1/3	Soil	<del></del>					ļ	<u> </u>			<u> </u>		<u> </u>	
вохувт5 9-21-99	Soil										<b></b>		<b></b>	
CHAIN OF POSSESSION Relinquished By 1045 1304	Date/Time	Si Received	gn/Print	Da	te/fime	See cl analy: analy:	ze for Np-237, ze for NO2/NO	comments isotopic U, 3, IC anion	on SAF B99-078. Ni-63, Tech-99, 1 Is, Sulfides, Ammo	ritium, Ou onia, Total C	at of ICP bottle yanide, and pH.	also	Matrix Soil Water Vapor	•
Relinquished By  Relinquished By  Relinquished By  Relinquished By  Relinquished By	Date/Time 7 9 14 60 Date/Time Date/Time	Received Received	By FEI	9/27/99 PD9.22.99 Da	LOS on terrime	Game (Uran (2) 10 Seleni Vanac	na Spec - Add- lium); Isotopic CP Metals - 601 lium, Silver]; IC lium, Zinc); M	on (Americ Plutonium; 0A (Supert P Metals - ercury - 74	ium-137, Cobalt-6 cium-241); Stronti ; Isotopic Thorium trace) (Arsenic, B 6010A (Supertrac 71 - (CV); Chrom	um-89,90 — 1 (Thorium-2 arium, Cadm e Add-On) ( um Hex - 71	Total Sr; Total V 32]; Americium ium, Chromium Beryllium, Cop 96	Jranium 1-241 , Lead,	Other Solid Other Liquid	i
FEREN CLAS LABORATORY Received By	599 0945		Din	<del>درم فاجيموه</del>	09US								Date/Time	
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FINAL SAMPLE Disposal Met	hod						Dispos	еа ву				-	>01€\ 1 JUE	j

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Chemical and Environmental Measurement Information

# Recra LabNet Philadelphia Analytical Report

Client: TNU-HANFORD B99-078

**W.O.#:** 10985-001-001-9999-00

RFW#: 9909L166

Date Received: 09-23-99

SDG/SAF#: H0541/B99-078

### **PCB**

One (1) soil sample was collected on 09-21-99.

The sample and its associated QC samples were extracted on 10-05-99 and analyzed according to Recra OPs based on SW846, 3rd Edition procedures on 10-08-99. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8082 for Aroclors only.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

- 1. The cooler temperature has been recorded on the chain-of-custody.
- 2. All required holding times for extraction and analysis have been met.
- 3. The sample and its associated QC samples received a sulfuric acid and sulfur cleanup.
- 4. The method blank was below the reporting limits for all target compounds.
- 5. All surrogate recoveries were within acceptance criteria.
- 6. The blank spike recovery was within acceptance criteria.
- 7. All matrix spike recoveries were within acceptance criteria.
- 8. All initial calibrations associated with this data set were within acceptance criteria.

9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

J. Michael Taylor

Vice President

Philadelphia Analytical Laboratory

pef\r:\group\data\pest\09L-166.pcb

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 7 pages.

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### Recra LabNet Philadelphia

## GLOSSARY OF PESTICIDE/PCB DATA

### **DATA QUALIFIERS**

- U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).
- J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.
- E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- I = Interference.

### **ABBREVIATIONS**

- BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.
- **BSD** = Indicates blank spike duplicate.
- MS = Indicates matrix spike.
- MSD = Indicates matrix spike duplicate.
- **DL** = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.
- NA = Not Applicable.
- **DF** = Dilution Factor.
- NR = Not Required.
- SP = Indicates Spiked Compound.



RFW 21-21-035/A-03/97

## Recra LabNet Philadelphia

### **GLOSSARY OF PESTICIDE/PCB DATA**

- P = This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".
- **D** = This flag identifies all compounds identified in an analysis at a secondary dilution factor.
- C = This flag applies to a compound that has been confirmed by GC/MS.

RFW #21-21-035/A-03/97



#### Recra LabNet - Lionville Laboratory

PCBs by GC

Report Date: 10/12/99 09:50

RFW\_Batch\_Number: 9909L166 Client: TNU-HANFORD B99-078 Work Order: 10985001001 Page: 1 d PBLKVY BS Cust ID: BOWBT3 BOWBT3 BOWBT3 PBLKVY Sample RFW#: 99LE1200-MB1 99LE1200-MB1 001 001 MS 001 MSD Information Matrix: SOIL SOIL SOIL SOIL SOIL D.F.: 1.00 1.00 1.00 1.00 1.00 Units: UG/KG UG/KG UG/KG UG/KG UG/KG Surrogate: Tetrachloro-m-xylene 102 110 108 100 110 % Decachlorobiphenvl 99 9 108 ° 104 ş 96 ş 102 35 U Aroclor-1016 34 IJ 35 U 33 U 33 U Aroclor-1221 67 U 70 U 69 U 70 U 67 U Aroclor-1232 35 U 34 U 35 U 33 U 33 U Aroclor-1242 33 U 33 U 35 U 34 U 35 U Aroclor-1248 \_\_\_\_\_ 35 U 34 U 35 U 33 U 33 U Aroclor-1254 89 % 35 U 88 % 33 U 84 % Aroclor-1260 \_\_\_\_ \_\_\_ 35 U 34 U 35 U 33 U 33 U

اسره والمعر

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. \*= Outside of EPA CLP QC

# Recra LabNet - Lionville Laboratory PCB ANALYTICAL DATA PACKAGE FOR TNU-HANFORD B99-078

DATE RECEIVED: 09/23/99

RFW LOT # :9909L166

CLIENT ID	RFW #	# MT	X PREP #	COLLECTION	EXTR/PREP	ANALYSIS
						<del></del>
BOWBT3	001	S	99LE1200	09/21/99	10/05/99	10/08/99
BOWBT3	001 1	MS S	99LE1200	09/21/99	10/05/99	10/08/99
BOWBT3	001 M	MSD S	99LE1200	09/21/99	10/05/99	10/08/99
LAB QC:						
PBLKVY	MB1	S	99LE1200	N/A	10/05/99	10/08/99
PBLKVY	MB1 I	BS S	99LE1200	$A \setminus N$	10/05/99	10/08/99

gw 20sm

RECRA	LabNet	Use	Only
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9909L166

# Custody Transfer Record/Lab Work Request Page \_\_\_ of \_\_\_

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Liquids																									
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Project Designation 200 Area Source characteriz	ation - 200-CW-1 OU	Samp	ling Location  B pond (B8758) >15'	<del>-</del>	<u> </u>			SAF No. B99-078				<b>45</b> ]	Days c
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1			No. of Container(s)	1	1	1	1		}	li .			
Special Handling and/or Sto	rage		Volume	60mL	250mL	250mL	500mL	·				-	: 
	SAMPLE ANAI	LYSIS		VOA - 8260A (TCL); VOA - 8260A (Add- On) {1- Propanol, Ethanol}	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (1) in Special Instructions.	See item (2 Special Instruction						
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CHAIN OF POSSESSION	PaterFire	Sign/Prin		ate/Time	See c	ze for Np-237,	comments isotopic U,	on SAF B99-078 Ni-63, Tech-99,	Tritium,	amma Spec. bottle Out of ICP bottle Cyanide, and pH	also	Matrix Soil Water	-
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DISPOSITION													

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Chemical and Environmental Measurement Information

# Recra LabNet Philadelphia Analytical Report

Client: TNU HANFORD B99-078

**W.O.** #: #: 10985-001-001-9999-00

**RFW** #: 9909L166

Date Received: 09-23-99

SDG/SAF#: H0541/B99-078

### GC SCAN

One (1) soil samples was collected on 09-21-99.

The sample and its associated QC samples were prepared on 09-24-99 and analyzed by methodology based on EPA Method 8015B for Ethanol and Butanol on 09-27-99.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

- 1. The sample was packaged and stored as specified in the method protocol; the cooler temperature upon receipt has been recorded on the chain-of-custody.
- 2. The required holding time for analysis was met.
- 3. All initial calibrations associated with this data set were within acceptance criteria.
- 4. All continuing calibration standards analyzed prior to the sample extracts were within acceptance criteria.
- 5. Surrogates were not used for this analysis.
- 6. The blank spike recovery was within advisory control limits of 50%-150%.

7. All matrix spike recoveries were within the advisory control limits of 50%-150%.

J. Michael Taylor Vice President

Philadelphia Analytical Laboratory

r:\share\lc\gcscan\09-166.doc

limits of 50%-150%.

See 7897077233

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Data

Log In

Date

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 6 pages.

### GLOSSARY OF OGCSC DATA

### **DATA QUALIFIERS**

- U = Indicates that the compound was analyzed for but not detected.

  The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).
- J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.
- E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- I = Interference.

### **ABBREVIATIONS**

- BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.
- BSD = Indicates blank spike duplicate.
- MS = Indicates matrix spike.
- MSD = Indicates matrix spike duplicate.
- DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.
- NA = Not Applicable.
- DF = Dilution Factor.
- NR = Not Required.
- SP = Indicates spiked compound.

#### Recra LabNet - Lionville Laboratory

GC SCAN

Report Date: 10/04/99 12:59 Work Order: 10985-001-001-9999-00 Page: 1 Client: TNU-HANFORD B99-078 \_\_\_ RFW Batch Number: 9909L166  $\mathfrak{C}$ Cust ID: BOWBT3 BOWBT3 BOWBT3 BLKBLK BS 0 99LLC144-MB1 99LLC144-MB1 001 001 MSD Sample RFW#: 001 MS SOIL SOIL Information Matrix: SOIL SOIL SOIL 1.00 D.F.: 1.00 1.00 1.00 1.00 mg/kg mq/kg Units: mg/kg mg/kg mg/kg 5.0 U 87 4.8 U 91 % 108 % n-Propvl Alcohol Ethanol 4.8 U 5.0 U 5.0 U 5.0 U 5.0 U

Mylany shipped

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not requested. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. \*= Outside of Advisory limits.

# Recra LabNet - Lionville Laboratory GCSC ANALYTICAL DATA PACKAGE FOR TNU-HANFORD B99-078

DATE RECEIVED: 09/23/99 RFW LOT # :9909L166

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOWBT3	001		99LLC144	09/21/99	09/24/99	09/27/99
BOWBT3	001 MS	S	99LLC144	09/21/99	09/24/99	09/27/99
BCWBT3	001 MSD	S	99LLC144	09/21/99	09/24/99	09/27/99
LAB QC:						
<del></del>						
BLK	MB1	S	99LLC144	N/A	09/24/99	09/27/99
BLK	MB1 BS	S	99LLC144	N/A	09/24/99	09/27/99



RECRA LabNet Use
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# Custody Transfer Record/Lab Work Request Page \_\_\_of\_\_\_\_

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Est. Final Proj. Sampling Date					#/Type Container		Liquid	<u> </u>								<u> </u>		<u> </u>								
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RECRA Project Manager							Solid	60 ml	250m		<u> </u>			-	EDM	-			_1							
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DL - Drum Liquids	<del> </del>	<del> </del>				$\vdash$	<del> </del>		<del> </del> -		<del> </del> -	<del> </del>					<b> </b>		ļ		ļ—					
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COMPOSITE														Hand Delivered Package ♂ or 2) Unbroken on O												
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Saf# B99-078					.   '	2) Ambient of Chilled 3) Press									on Sam ❤) or											
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Bechtel Hanford Inc.	CF	IAIN OF CUST	rody/s	AMPLE	E ANAL	YSIS	REQUEST		B99	9-078-122	Page <u>1</u>	of <u>1</u>
Collector  Bowers/Trice		ny Contact s Cearlock	Telephor				Project Coordit	ator	Price Code	8N	Data Tu	rnaround (
Project Designation 200 Area Source characterization - 200-CW-1 OU	Sampli	ng Location B pond (B8758) >15'			<del></del>		SAF No. B99-078				45	Days 🗧
<del></del>	Field L	og book No.					Method of Ship	ment				
ERC 94-063	EL-1	511 Property No.	<del></del>				Fed Ex	ta Dili Na				
Shipped To THARECRA DFD 9-21-99 AFCRA	John	A 990	266	2	<del></del>		Bill of Lading/A 423 COA Ba	5	952	966	o'f	
	<del></del>		<del>,</del>				COA B2	OCU	167	10		
POSSIBLE SAMPLE HAZARDS/REMARKS		Preservation	Cool 4C	Cool 4C	None	Cool 44						
		Type of Container	aG	aG	aG	aG					<del> </del> -	
	ļ	No. of Container(s)	1	1	1	1					<b> </b>	
Special Handling and/or Storage	-	Volume	60mL	250mL	250mL	500mI	.		<b>\</b>			İ
SAMPLE ANALYSIS	<u> </u>		VOA - \$260A (TCL); VOA - \$260A (Add- On) { I- Propanol, Ethanol }	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (1) in Special Instructions.	See item (2 Special Instructio	` <b>\</b>					
Sample No.	Sample Date	Sample Time		al a de la c		1.08/1.02		بطأة الماث			1	
BOWBT2 Soil									<u> </u>	<u> </u>		
BOWBT3 Soil 9	-21-79	1250		<u> X</u>		X			Damca)		<u> </u>	<u> </u>
BOWBTA 1/3 Soil			,						<u> </u>	<u></u>		
BOWBTS G-21-99 Soil				 								
7					 				<u> </u>	<u> </u>	<u> </u>	
CHAIN OF POSSESSION	Sign/Print		te/Time	See ch analyz	e for Np-237,	comments isotopic U	S on SAF B99-078. Ni-63, Tech-99, T ns, Sulfides, Ammo	ritium, . O	ut of ICP bottle	also	Matrix Soil Water	•
Bong Bowers 9-21-99/1630 B of 10 9-11-89/ Retinqueshed By Date/Time Received By Date				(1) Gamm	amma Spectros a Spec - Add-	scopy (Ces on (Americ	ium-137, Cobalt-60 cium-241}; Strontiu	), Europium ım-89,90	-152, Europium Total Sr; Total I	-155); Uranium	Vapor Other Solid Other Liquid	
Vel 15 9.27.99 1100   Retinquished By Date Time   Re						IOA (Super CP Metals -	trace) (Arsenic, Ba	rium, Cadm : Add-On) (	ium, Chromium Beryllium, Cop	, Lead,		
celinquished By Date/Time Re	ceived By CT		te/Time		•	•	LABLE TI					
Feder 923-99 0945 -	Mus	and 652.88	cq (15)	<u></u>						L	Date/Time	
SECTION FINAL SAMPLE Disposal Method					Dispos	sed By			<u> </u>		Date/Time	

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Chemical and Environmental Measurement Information

# Recra LabNet Philadelphia Analytical Report

W.O. #: 10985-001-001-9999-00

Date Received: 09-23-99

RFW#: 9909L166 SDG#: H0541 SAF#: B99-078

# **INORGANIC CASE NARRATIVE**

Client: TNU-HANFORD B99-078

1. This narrative covers the analyses of 1 soil sample.

- 2. The sample was prepared and analyzed in accordance with the methods indicated on the attached glossary.
- 3. Sample holding times as required by the method and/or contract were met with the exception of Total Cyanide and Sulfide analyses.
- 4. The cooler temperature was recorded on the chain-of-custody.
- 5. The method blanks were within method criteria.
- 6. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS were within the 20% Relative Percent Difference (RPD) control limit.
- 7. The matrix spike recoveries were within the 75-125% control limits. The matrix spike duplicates were within the 20% RPD control limit.
- 8. The replicate analyses were within the 20% Relative Percent Difference (RPD) control limit.
- 9. Results for solid samples are reported on a dry weight basis.

J. Michael Taylor

Vice President

Philadelphia Analytical Laboratory

njp\i09-166

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 14 pages.

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# Recra LabNet Philadelphia

# WET CHEMISTRY METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

	<u>ASTM</u>	<u>SW846</u>	<u>OTHER</u>
% Ash	D2216-80		
% Moisture	D2216-80		ILMO4.0 (e)
% Solids	D2216-80		ILMO4.0 (e)
% Volatile Soilids	D2216-80		
ASTM Extraction in Water	D3987-81/85		
BTU	D240-87		
CEC		9081	c
Chromium VI		✓ 3060A/7196A	
Corrosivity by coupon by pH			I5C
Cyanide, Total		9010B	ILMO4.0 (e)
Cyanide, Reactive		Section 7.3	
Halides, Extractable Organic		9020 <b>B</b>	EPA 600/4/84-008
Halides, Total		9020 <b>B</b>	EPA 600/4/84-008
EP Toxicity		1310A	
Flash Point		1010	
Ignitability		1010	
Oil & Grease		9071A	
Carbon, Total Organic		9060	Lloyd Kahn (mod)
Oxygne Bomb Prep for Anions	D240-87(mod)	5050	
Petroleum Hydrocarbons, Total R	ecoverable	9071	EPA 418.1
pH, Soil		✓ 9045C	
Sulfide, Reactive		Section 7.3	
Sulfide		9030 <b>B</b> (mod)	
Specific Gravity	D1429-76C/ _	D5057-90	
Sulfur, Total		9056	
Synthetic Prpearation Leach		1312	
Paint Filter		909 <b>5A</b>	
Other: Attate Attete	Method: ¿	=PA353.2	
Other: ammoria	Method	EPA350.3	<u> </u>
Chloride Fluori	de Mitrate.	2012.5	
Betrete Sharch	to Willeto	EFA 300.0	

# Recra LabNet Philadelphia METHOD REFERENCES AND DATA QUALIFIERS

# **DATA QUALIFIERS**

- U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.
- \* = Indicates that the original sample result is greater than 4x the spike amount added.

# **ABBREVIATIONS**

MB = Method or Preparation Blank.

MS = Matrix Spike.

MSD = Matrix Spike Duplicate.

REP = Sample Replicate

LC = Laboratory Control Sample.

NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

# **ANALYTICAL WET CHEMISTRY METHODS**

- 1. ASTM Standard Methods.
- 2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).
- 3. Test Methods for Evaluating Solid Waste (USEPA SW-846).
- a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).
- b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).
- c. <u>Method of Soil Analysis</u>, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).
- d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).
- e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.
- f. Code of Federal Regulations.

L-WI-034/D-6/99

#### INORGANICS DATA SUMMARY REPORT 12/31/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L166

					reporti <b>ng</b>	DILUTION	
SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	LIMIT	FACTOR	
======	***====================================	****	E = 5 # # # # #			******	
-001	BOWBT3	% Solids	95.3	•	0.01	1.0	
		Chloride by IC	2.5	MG/KG	1.3	1.0	
		Fluoride by IC	2.6 u	MG/KG	2.6	1.0	
		Nitrite by IC	1.3 u	MG/KG	1.3	1.0	
		Nitrate by IC	1.3 u	MG/KG	1.3	1.0	
		Cyanide, Total	0.52 u	MG/KG	0.52	1.0	
		Phosphate by IC	1.3 u	MG/KG	1.3	1.0	
		Chromium VI	0.42 u	MG/KG	0.42	1.0	
		Sulfate by IC	72.2	MG/KG	5.2	4.0	
		Nitrate Nitrite	0.24	MG/KG	0.20	1.0	
		Ammonia, as N	1.3 u	MG/KG	1.3	1.0	
		рН	8.7	SOIL PH	0.01	1.0	
		Sulfide	1.0 u	MG/KG	1.0	1.0	

# INORGANICS METHOD BLANK DATA SUMMARY PAGE 12/31/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L166

WORK OKDE	K: 10362-001-001-3333-	00				
					REPORTING	DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	LIMIT	FACTOR
		*************	******	=====	*********	*******
BLANK10	99LIC083-MB1	Chloride by IC	1.2 u	MG/KG	1.2	1.0
		Fluoride by IC	2.5 u	MG/KG	2.5	1.0
		Nitrite by IC	1.2 u	MG/KG	1.2	1.0
		Nitrate by IC	1.2 u	MG/KG	1.2	1.0
		Phosphate by IC	1.2 u	MG/KG	1.2	1.0
BLANK10	99LC112A-MB1	Cyanide, Total	0.50 u	MG/K <b>G</b>	0.50	1.0
BLANK10	99LVI068-MB1	Chromium VI	0. <b>4</b> 0 u	MG/KG	0.40	1.0
BLANK10	99LICA63-MB1	Sulfate by IC	1.2 u	MG/KG	1.2	1.0
BLANK10	99LN3D47-MB1	Nitrate Nitrite	0.20 u	MG/KG	0.20	1.0
BLANK10	99LAM038- <b>MB1</b>	Ammonia, as N	1.2 u	MG/KG	1.2	1.0
BLANK10	99LAM050~MB1	Ammonia, as N	1.2 u	MG/KG	1.2	1.0
BLANK10	99LSD051-MB1	Sulfide	1.0 u	MG/KG	1.0	1.0

# INORGANICS ACCURACY REPORT 12/31/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L166

			SPIKED	INITIAL	SPIKED		DILUTION
SAMPLE	SITE ID	ANALYTE	SAMPLE	RESULT	AMOUNT	*RBCOV	FACTOR (SPK)
	=======================================	****	=== <b>###</b>				E=======
-001	BOWBT3	Chloride by IC	28.5	2.5	26.2	98.8	1.0
		Chloride by IC MSD	28.5	2.5	26.2	98.9	1.0
		Fluoride by IC	60.0	1.2	52.5	112.0	1.0
		Fluoride by IC MSD	58.6	1.2	52.5	109.4	1.0
		Nitrite by IC	28	1.3 u	26	105.0	1.0
		Nitrite by IC MSD	27	1.3 u	26	102.3	1.0
		Nitrate by IC	27	1.3 u	26	103.0	1.0
		Nitrate by IC MSD	27	1.3 u	26	101.7	1.0
		Cyanide, Total	5.1	0.52u	5.2	96.9	1.0
		Cyanide, Total MSD	5.3	0.52u	5.2	100.9	1.0
		Phosphate by IC	27.1	1.3 u	26.2	103.3	1.0
		Phosphate by IC MSD	27.0	1.3 u	26.2	102.8	1.0
		Soluble Chromium VI	4.0	0.42u	4.2	95.5	1.0
		Insoluble Chromium VI	1220	0.42u	1180	103.8	100
		Sulfate by IC	184	72.2	105	106.9	4.0
		Sulfate by IC MSD	184	72.2	105	106.6	4.0
		Nitrate Nitrite	5.6	0.24	5.2	102.9	1.0
		Nitrate Nitrite MSD	5.6	0.24	5.2	101.9	1.0
		Ammonia, as N	105	1.3 u	104	100.6	1.0
		Sulfide	345	0.0	379	91.1	1.0
		Sulfide MSD	377	0.0	408	92.4	1.0
BLANK10	99LIC083-MB1	Chloride by IC	23.6	1.2 u	25.0	94.5	1.0
		Fluoride by IC	52.4	2.5 u	50.0	104.6	1.0
		Nitrite by IC	24	1.2 u	25	97.8	1.0
		Nitrate by IC	24	1.2 u	25	95.8	1.0
		Phosphate by IC	25.1	1.2 u	25.0	100.5	1.0
BLANK10	99LVI068-MB1	Soluble Chromium VI	4.0	0.40u	4.0	99.9	1.0
		Insoluble Chromium VI	1180	0.40u	1160	101.3	100
BLANK10	99LICA83-MB1	Sulfate by IC	23.5	1,2 u	25.0	93.9	1.0
BLANK10	99LN3D47-MB1	Nitrate Nitrite	5.0	0.20u	5.0	101.0	1.0
		Nitrate Nitrite MSD	5.1	0.20u	5.0		1.0
BLANK10	99LAM038-MB1	Ammonia, as N	48.6	1.2 u	50.6		1.0
		Ammonia, as N MSD	51.0	1.2 u	50.		1.0
BLANK10	99LAM050-MB1	Ammonia, as N	49.5	1.2 u	50.		1.0
		Ammonia, as N MSD	50.2	1.2 u	50.		1.0
BLANK10	99LSD051-MB1	Sulfide	9.4	1.0 u	10.	0 94.0	1.0

#### INORGANICS DUPLICATE SPIKE REPORT 12/31/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L166

			SPIKE#	}	
SAMPLE	SITE ID	ANALYTE	*RECOV	*RECOV	*DIFF
*====	E		*****	*****	*****
-001	BOWBT3	Chloride by IC	98.8	98.9	0.058
		Pluoride by IC	112.0	109.4	2.3
		Nitrite by IC	105.0	102.3	2.6
		Nitrate by IC	103.0	101.7	1.3
		Cyanide, Total	96.9	100.9	4.0
		Phosphate by IC	103.3	102.8	0.54
		Sulfate by IC	106.9	106.6	0.24
		Nitrate Nitrite	102.9	101.9	0.93
		Sulfide	91.1	92.4	1.3
BLANK10	99LN3D47-MB1	Nitrate Nitrite	101.0	102.6	1.6
BLANK10	99LAM038-MB1	Ammonia, as N	97.2	102.0	4.8
BLANK10	99LAM050-MB1	Ammonia, as N	99.0	100.5	1.5

#### INORGANICS PRECISION REPORT 12/31/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L166

			INITIAL			DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT	REPLICATE	RPD	FACTOR (RBP)
*****	***********	************			E S F T T X X	
-001REP	BOWBT3	% Solids	95.3	93.5	1.9	1.0
		Chloride by IC	2.5	2.7	6.0	1.0
		Fluoride by IC	2.6 u	2.6 u	NC	1.0
		Nitrite by IC	1.3 u	1.3 u	NC	1.0
		Nitrate by IC	1.3 u	1.3 ម	NC	1.0
		Cyanide, Total	0.52u	0.52u	NC	1.0
		Phosphate by IC	1.3 u	1.3 u	NC	1.0
		Chromium VI	0.42u	0.42u	NC	1.0
		Sulfate by IC	72.2	72.3	0.16	4.0
		Nitrate Nitrite	0.24	0.27	9.0	1.0
		Ammonia, as N	1.3 u	1.3 u	NC	1.0
		pн	8.7	8.8	0.7	1.0
		sulfide	1.0 u	3.6	ИС	1.0

# INORGANICS LABORATORY CONTROL STANDARDS REPORT 12/31/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L166

			SPIKED	SPIKED		
SAMPLE	SITE ID	ANALYTE	SAMPLE	TRUOMA	UNITS	*RECOV
==== <b>=</b>	=======================================	***********	======	*****	*====	******
LCS10	99LC112A-LC1	Cyanide, Total LCS	1.8	2.0	MG/KG	92.2
LCS20	99LC112A-LC2	Cyanide, Total LCS	9.6	10	MG/KG	96.5

# Recra LabNet - Lionville Laboratory INORGANIC ANALYTICAL DATA PACKAGE FOR TNU-HANFORD B99-078

DATE RECEIVED: 09/23/99 RFW LOT # :9909L166

\$ SOLIDS	0,,,,	2, 33		RIW 201 # 199092200			
\$ SOLIDS  001 S 99L%S128 09/21/99 10/01/99 10/03/  CHLORIDE BY IC 001 S 99LICO83 09/21/99 10/04/99 10/04/99  CHLORIDE BY IC 001 REP S 99LICO83 09/21/99 10/04/99 10/04/99  CHLORIDE BY IC 001 MS S 99LICO83 09/21/99 10/04/99 10/04/99  CHLORIDE BY IC 001 MSD S 99LICO83 09/21/99 10/04/99 10/04/99  FLUCRIDE BY IC 001 MSD S 99LICO83 09/21/99 10/04/99 10/04/99  FLUCRIDE BY IC 001 S 99LICO83 09/21/99 10/04/99 10/04/99  FLUCRIDE BY IC 001 REP S 99LICO83 09/21/99 10/04/99 10/04/99  FLUCRIDE BY IC 001 REP S 99LICO83 09/21/99 10/04/99 10/04/99  FLUCRIDE BY IC 001 MSD S 99LICO83 09/21/99 10/04/99 10/04/99  FLUCRIDE BY IC 001 MSD S 99LICO83 09/21/99 10/04/99 10/04/99  NITRITE BY IC 001 MSD S 99LICO83 09/21/99 10/04/99 10/04/99  NITRITE BY IC 001 REP S 99LICO83 09/21/99 10/04/99 10/04/99  NITRITE BY IC 001 REP S 99LICO83 09/21/99 10/04/99 10/04/99  NITRITE BY IC 001 MSD S 99LICO83 09/21/99 10/04/99 10/04/99  NITRITE BY IC 001 MSD S 99LICO83 09/21/99 10/04/99 10/04/99  NITRATE BY IC 001 MSD S 99LICO83 09/21/99 10/04/99 10/04/99  NITRATE BY IC 001 MSD S 99LICO83 09/21/99 10/04/99 10/04/99  NITRATE BY IC 001 REP S 99LICO83 09/21/99 10/04/99 10/04/99  NITRATE BY IC 001 MSD S 99LICO83 09/21/99 10/04/99 10/04/99  NITRATE BY IC 001 MSD S 99LICO83 09/21/99 10/04/99 10/04/99  TOTAL CYANIDE 001 MSD S 99LICO83 09/21/99 10/04/99 10/04/99  TOTAL CYANIDE 001 MSD S 99LICO83 09/21/99 10/04/99 10/06/99  TOTAL CYANIDE 001 MSD S 99LICO83 09/21/99 10/04/99 10/06/99  TOTAL CYANIDE 001 MSD S 99LICO83 09/21/99 10/06/99 10/06/99  TOTAL CYANIDE 001 MSD S 99LICO83 09/21/99 10/06/99 10/06/99  TOTAL CYANIDE 001 MSD S 99LICO83 09/21/99 10/04/99 10/06/99  TOTAL CYANIDE 001 MSD S 99LICO83 09/21/99 10/06/99 10/06/99  TOTAL CYANIDE 001 MSD S 99LICO83 09/21/99 10/06/99 10/06/99  TOTAL CYANIDE 001 MSD S 99LICO83 09/21/99 10/06/99 10/06/99  TOTAL CYANIDE 001 MSD S 99LICO83 09/21/99 10/06/99 10/06/99  TOTAL CYANIDE 001 MSD S 99LICO83 09/21/99 10/06/99 10/06/99  TOTAL CYANIDE 001 MSD S 99LICO83 09/21/99 10/06/99 10/06/99  TOTAL CYANIDE 001 MSD S 99LICO83 09/21/99	CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
\$ SOLIDS	BOWBT3						
CHLORIDE BY IC 001 S 99LICO83 09/21/99 10/04/99 10/04/99 10/04/CHLORIDE BY IC 001 REP S 99LICO83 09/21/99 10/04	% SOLIDS	001	S	99L%S128	09/21/99	10/01/99	10/03/99
CHLORIDE BY IC 001 REP S 99LIC083 09/21/99 10/04/99 10/04/ CHLORIDE BY IC 001 MS S 99LIC083 09/21/99 10/04/99 10/04/ FLUORIDE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ FLUORIDE BY IC 001 REP S 99LIC083 09/21/99 10/04/99 10/04/ FLUORIDE BY IC 001 REP S 99LIC083 09/21/99 10/04/99 10/04/ FLUORIDE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ FLUORIDE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ NITRITE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ NITRITE BY IC 001 REP S 99LIC083 09/21/99 10/04/99 10/04/ NITRITE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ NITRITE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ NITRITE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ NITRITE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ NITRATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ NITRATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ NITRATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ NITRATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ NITRATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ TOTAL CYANIDE 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ TOTAL CYANIDE 001 MSD S 99LIC083 09/21/99 10/06/99 10/06/ TOTAL CYANIDE 001 MSD S 99LIC083 09/21/99 10/06/99 10/06/ TOTAL CYANIDE 001 MSD S 99LIC083 09/21/99 10/06/99 10/06/ TOTAL CYANIDE 001 MSD S 99LIC083 09/21/99 10/06/99 10/06/ TOTAL CYANIDE 001 MSD S 99LIC12A 09/21/99 10/06/99 10/06/ PHOSPHATE BY IC 001 MSD S 99LIC12A 09/21/99 10/06/99 10/06/ PHOSPHATE BY IC 001 MSD S 99LIC083 09/21/99 10/06/99 10/06/ PHOSPHATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/99 PHOSPHATE BY IC 001 MSD S 99LIC083 09/21/99 10/06/99 10/06/99 CHROMIUM VI 001 MSD S 99LIC083 09/21/99 10/06/99 10/06/99 CHROMIUM VI 001 MSD S 99LIC083 09/21/99 10/06/99 10/06/99 CHROMIUM VI 001 MSD S 99LIC083 09/21/99 10/06/99 10/06/99 CHROMIUM VI 001 MSD S 99LIC083 09/21/99 10/06/99 10/06/99 CHROMIUM VI 001 MSD S 99LIC083 09/21/99 10/06/99 10/06/99 CHROMIUM VI 001 MSD S 99LV068 09/21/99 10/06/99 10/06/99 SULFATE BY IC 001 MSD S 99LV068 09/21/99 10/06/99 10/06/9	% SOLIDS	001 REP	S	99L%S128	09/21/99	10/01/99	10/03/99
CHLORIDE BY IC 001 MS S 99LIC083 09/21/99 10/04/99 10/04/ CHLORIDE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ FLUORIDE BY IC 001 S 99LIC083 09/21/99 10/04/99 10/04/ FLUORIDE BY IC 001 REP S 99LIC083 09/21/99 10/04/99 10/04/ FLUORIDE BY IC 001 MS S 99LIC083 09/21/99 10/04/99 10/04/ FLUORIDE BY IC 001 MS S 99LIC083 09/21/99 10/04/99 10/04/ FLUORIDE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ FLUORIDE BY IC 001 S 99LIC083 09/21/99 10/04/99 10/04/ NITRITE BY IC 001 REP S 99LIC083 09/21/99 10/04/99 10/04/ NITRITE BY IC 001 MS S 99LIC083 09/21/99 10/04/99 10/04/ NITRITE BY IC 001 MS S 99LIC083 09/21/99 10/04/99 10/04/ NITRITE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ NITRATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ NITRATE BY IC 001 REP S 99LIC083 09/21/99 10/04/99 10/04/ NITRATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ NITRATE BY IC 001 MS S 99LIC083 09/21/99 10/04/99 10/04/ NITRATE BY IC 001 MS S 99LIC083 09/21/99 10/04/99 10/04/ NITRATE BY IC 001 MS S 99LIC083 09/21/99 10/04/99 10/04/ NITRATE BY IC 001 MS S 99LIC083 09/21/99 10/06/99 10/06/ NITRATE BY IC 001 MSD S 99LIC083 09/21/99 10/06/99 10/06/ TOTAL CYANIDE 001 S 99LIC083 09/21/99 10/06/99 10/06/ TOTAL CYANIDE 001 S 99LIC083 09/21/99 10/06/99 10/06/ TOTAL CYANIDE 001 MSD S 99LIC12A 09/21/99 10/06/99 10/06/ TOTAL CYANIDE 001 MSD S 99LIC12A 09/21/99 10/06/99 10/06/ PHOSPHATE BY IC 001 REP S 99LC112A 09/21/99 10/06/99 10/06/ PHOSPHATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ PHOSPHATE BY IC 001 MSD S 99LIC083 09/21/99 10/06/99 10/06/ PHOSPHATE BY IC 001 MSD S 99LIC083 09/21/99 10/06/99 10/06/ CHROMIUM VI 001 REP S 99LIC083 09/21/99 10/06/99 10/06/ CHROMIUM VI 001 REP S 99LIC083 09/21/99 10/06/99 10/06/99 10/06/ CHROMIUM VI 001 REP S 99LIC083 09/21/99 10/06/99	CHLORIDE BY IC	001	S	99LIC083	09/21/99	10/04/99	10/04/99
CHLORIDE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ FLUORIDE BY IC 001 REP S 99LIC083 09/21/99 10/04/99 10/04/ FLUORIDE BY IC 001 REP S 99LIC083 09/21/99 10/04/99 10/04/ FLUORIDE BY IC 001 MS S 99LIC083 09/21/99 10/04/99 10/04/ FLUORIDE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ FLUORIDE BY IC 001 REP S 99LIC083 09/21/99 10/04/99 10/04/ NITRITE BY IC 001 REP S 99LIC083 09/21/99 10/04/99 10/04/ NITRITE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ NITRITE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ NITRITE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ NITRATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ NITRATE BY IC 001 REP S 99LIC083 09/21/99 10/04/99 10/04/ NITRATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ NITRATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ NITRATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ NITRATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ TOTAL CYANIDE 001 S 99LIC083 09/21/99 10/04/99 10/04/ TOTAL CYANIDE 001 MSD S 99LIC083 09/21/99 10/06/99 10/06/ TOTAL CYANIDE 001 MSD S 99LIC12A 09/21/99 10/06/99 10/06/ PHOSPHATE BY IC 001 MSD S 99LC112A 09/21/99 10/06/99 10/06/ PHOSPHATE BY IC 001 MSD S 99LIC083 09/21/99 10/06/99 10/06/ PHOSPHATE BY IC 001 MSD S 99LIC083 09/21/99 10/06/99 10/06/ PHOSPHATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ PHOSPHATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ PHOSPHATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ PHOSPHATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ CHROMIUM VI 001 S 99LV1068 09/21/99 10/05/99 10/05/ CHROMIUM VI 001 MSD S 99LIC088 09/21/99 10/05/99 10/05/ CHROMIUM VI 001 MSD S 99LV1068 09/21/99 10/05/99 10/05/ CHROMIUM VI 001 MSD S 99LV1068 09/21/99 10/05/99 10/0	CHLORIDE BY IC	001 REP		99LIC083	09/21/99	10/04/99	10/04/99
FLUORIDE BY IC	CHLORIDE BY IC	001 MS	S	99LIC083	09/21/99	10/04/99	10/04/99
FLUORIDE BY IC	CHLORIDE BY IC	001 MSD	S	99LIC083	09/21/99	10/04/99	10/04/99
FLUORIDE BY IC 001 MS S 99LIC083 09/21/99 10/04/99 10/04/97 FLUORIDE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/97	FLUORIDE BY IC	001	S	99LIC083	09/21/99	10/04/99	10/04/99
FLUORIDE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ NITRITE BY IC 001 REP S 99LIC083 09/21/99 10/04/99 10/04/ NITRITE BY IC 001 REP S 99LIC083 09/21/99 10/04/99 10/04/ NITRITE BY IC 001 MS S 99LIC083 09/21/99 10/04/99 10/04/ NITRITE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ NITRITE BY IC 001 S 99LIC083 09/21/99 10/04/99 10/04/ NITRATE BY IC 001 REP S 99LIC083 09/21/99 10/04/99 10/04/ NITRATE BY IC 001 REP S 99LIC083 09/21/99 10/04/99 10/04/ NITRATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ NITRATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ NITRATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ TOTAL CYANIDE 001 S 99LC112A 09/21/99 10/06/99 10/06/ TOTAL CYANIDE 001 MSD S 99LC112A 09/21/99 10/06/99 10/06/ TOTAL CYANIDE 001 MS S 99LC112A 09/21/99 10/06/99 10/06/ PHOSPHATE BY IC 001 MSD S 99LIC083 09/21/99 10/06/99 10/06/ PHOSPHATE BY IC 001 MSD S 99LIC083 09/21/99 10/06/99 10/06/ PHOSPHATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ PHOSPHATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ PHOSPHATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ PHOSPHATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ PHOSPHATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/ PHOSPHATE BY IC 001 MSD S 99LIC083 09/21/99 10/05/99 10/05/99 CHROMIUM VI 001 REP S 99LV1068 09/21/99 10/05/99 10/05/99 CHROMIUM VI 001 MS S 99LV1068 09/21/99 10/05/99 10/05/99 CHROMIUM VI 001 MSD S 99LV1068 09/21/99 10/05/99 10/05/99 CHROMIUM VI 001 MSD S 99LV1068 09/21/99 10/05/99 10/05/99 SULFATE BY IC 001 MSD S 99LV1068 09/21/99 10/05/99 10/05/99	FLUORIDE BY IC	001 REP	S	99LIC083	09/21/99	10/04/99	10/04/99
NITRITE BY IC	FLUORIDE BY IC	001 MS	S	99LIC083	09/21/99	10/04/99	10/04/99
NITRITE BY IC	FLUORIDE BY IC	001 MSD	S	99LIC083	09/21/99	10/04/99	10/04/99
NITRITE BY IC 001 REP S 99LIC083 09/21/99 10/04/99 10/04/99 NITRITE BY IC 001 MS S 99LIC083 09/21/99 10/04/99 10/04/99 NITRITE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/99 NITRATE BY IC 001 S 99LIC083 09/21/99 10/04/99 10/04/99 NITRATE BY IC 001 REP S 99LIC083 09/21/99 10/04/99 10/04/99 NITRATE BY IC 001 MS S 99LIC083 09/21/99 10/04/99 10/04/99 NITRATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/97 TOTAL CYANIDE 001 S 99LIC083 09/21/99 10/06/99 10/06/97 TOTAL CYANIDE 001 S 99LC112A 09/21/99 10/06/99 10/06/97 TOTAL CYANIDE 001 MS S 99LC112A 09/21/99 10/06/99 10/06/97 TOTAL CYANIDE 001 MS S 99LC112A 09/21/99 10/06/99 10/06/97 TOTAL CYANIDE 001 MSD S 99LC112A 09/21/99 10/06/99 10/06/99 PHOSPHATE BY IC 001 S 99LIC083 09/21/99 10/06/99 10/06/99 PHOSPHATE BY IC 001 REP S 99LIC083 09/21/99 10/04/99 10/04/99 PHOSPHATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/99 PHOSPHATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/99 PHOSPHATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/99 PHOSPHATE BY IC 001 MSD S 99LIC083 09/21/99 10/05/99 10/05/99 CHROMIUM VI 001 REP S 99LV1068 09/21/99 10/05/99 10/05/99 CHROMIUM VI 001 MSD S 99LV1068 09/21/99 10/05/99 10/05/99 CHROMIUM VI 001 MSD S 99LV1068 09/21/99 10/05/99 10/05/99 SULFATE BY IC 001 MSD S 99LV1068 09/21/99 10/05/99 10/05/99	NITRITE BY IC	001	s		09/21/99	10/04/99	10/04/99
NITRITE BY IC 001 MS S 99LIC083 09/21/99 10/04/99 10/04/99 NITRITE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/99 NITRATE BY IC 001 S 99LIC083 09/21/99 10/04/99 10/04/99 NITRATE BY IC 001 REP S 99LIC083 09/21/99 10/04/99 10/04/99 NITRATE BY IC 001 MS S 99LIC083 09/21/99 10/04/99 10/04/99 NITRATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/99 NITRATE BY IC 001 MSD S 99LIC083 09/21/99 10/06/99 10/06/97 TOTAL CYANIDE 001 S 99LC112A 09/21/99 10/06/99 10/06/97 TOTAL CYANIDE 001 MS S 99LC112A 09/21/99 10/06/99 10/06/97 TOTAL CYANIDE 001 MSD S 99LC112A 09/21/99 10/06/99 10/06/97 TOTAL CYANIDE 001 MSD S 99LC112A 09/21/99 10/06/99 10/06/99 PHOSPHATE BY IC 001 S 99LIC083 09/21/99 10/04/99 10/04/99 PHOSPHATE BY IC 001 REP S 99LIC083 09/21/99 10/04/99 10/04/99 PHOSPHATE BY IC 001 MS S 99LIC083 09/21/99 10/04/99 10/04/99 PHOSPHATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/99 CHROMIUM VI 001 S 99LV1068 09/21/99 10/05/99 10/05/99 CHROMIUM VI 001 MS S 99LV1068 09/21/99 10/05/99 10/05/99 CHROMIUM VI 001 MS S 99LV1068 09/21/99 10/05/99 10/05/99 CHROMIUM VI 001 MSD S 99LV1068 09/21/99 10/05/99 10/05/99 SULFATE BY IC 001 MSD S 99LV1068 09/21/99 10/05/99 10/05/99 SULFATE BY IC 001 MSD S 99LV1068 09/21/99 10/04/99 10/04/99	NITRITE BY IC	001 REP	S	99LIC083	09/21/99	10/04/99	10/04/99
NITRITE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/99 NITRATE BY IC 001 S 99LIC083 09/21/99 10/04/99 10/04/99 NITRATE BY IC 001 REP S 99LIC083 09/21/99 10/04/99 10/04/99 NITRATE BY IC 001 MS S 99LIC083 09/21/99 10/04/99 10/04/99 NITRATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/99 NITRATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/99 TOTAL CYANIDE 001 S 99LC112A 09/21/99 10/06/99 10/06/99 TOTAL CYANIDE 001 MS S 99LC112A 09/21/99 10/06/99 10/06/99 TOTAL CYANIDE 001 MSD S 99LC112A 09/21/99 10/06/99 10/06/99 PHOSPHATE BY IC 001 MSD S 99LC112A 09/21/99 10/06/99 10/06/99 PHOSPHATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/99 PHOSPHATE BY IC 001 REP S 99LIC083 09/21/99 10/04/99 10/04/99 PHOSPHATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/99 PHOSPHATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/99 CHROMIUM VI 001 S 99LV1068 09/21/99 10/05/99 10/05/99 CHROMIUM VI 001 MSD S 99LV1068 09/21/99 10/05/99 10/05/99 CHROMIUM VI 001 MSD S 99LV1068 09/21/99 10/05/99 10/05/99 CHROMIUM VI 001 MSD S 99LV1068 09/21/99 10/05/99 10/05/99 SULFATE BY IC 001 MSD S 99LV1068 09/21/99 10/05/99 10/05/99	NITRITE BY IC	001 MS	S	99LIC083	09/21/99		10/04/99
NITRATE BY IC 001 REP S 99LIC083 09/21/99 10/04/99 10/06/99 10/04/99 10/04/99 10/04/99 10/04/99 10/04/99 10/04/99 10/04/99 10/04/99 10/06/99 10/05/	NITRITE BY IC	001 MSD	S	99LIC083	09/21/99	10/04/99	10/04/99
NITRATE BY IC 001 REP S 99LIC083 09/21/99 10/04/99 10/06/	NITRATE BY IC	001	S	99LIC083	09/21/99	10/04/99	10/04/99
NITRATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/70TAL CYANIDE 001 S 99LC112A 09/21/99 10/06/99 10/06/70TAL CYANIDE 001 REP S 99LC112A 09/21/99 10/06/99 10/06/70TAL CYANIDE 001 MS S 99LC112A 09/21/99 10/06/99 10/06/70TAL CYANIDE 001 MSD S 99LC112A 09/21/99 10/06/99 10/06/70TAL CYANIDE 001 MSD S 99LC112A 09/21/99 10/06/99 10/06/70TAL CYANIDE 001 MSD S 99LC112A 09/21/99 10/04/99 10/04/70TAL CYANIDE 001 REP S 99LIC083 09/21/99 10/04/99 10/04/70TAL CYANIDE 001 REP S 99LIC083 09/21/99 10/04/99 10/04/70TAL CYANIDE 001 MS S 99LIC083 09/21/99 10/04/99 10/04/70TAL CYANIDE 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/70TAL CYANIDE 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/70TAL CYANIDE 001 MSD S 99LIC083 09/21/99 10/05/99 10/05/70TAL CYANIDE 001 MSD S 99LVI068 09/21/99 10/05/99 10/05/70TAL CYANIDE 001 MSD S 99LVI068 09/21/99 10/05/99 10/05/70TAL CYANIDE 001 MSD S 99LVI068 09/21/99 10/05/99 10/05/70TAL CYANIDE 001 MSD S 99LVI068 09/21/99 10/05/99 10/05/70TAL CYANIDE 001 MSD S 99LVI068 09/21/99 10/05/99 10/05/70TAL CYANIDE 001 MSD S 99LVI068 09/21/99 10/05/99 10/05/70TAL CYANIDE 001 MSD S 99LVI068 09/21/99 10/05/99 10/05/70TAL CYANIDE 001 MSD S 99LVI068 09/21/99 10/05/99 10/05/70TAL CYANIDE 001 MSD S 99LVI068 09/21/99 10/05/99 10/05/70TAL CYANIDE 001 MSD S 99LVI068 09/21/99 10/05/99 10/05/70TAL CYANIDE 001 MSD S 99LVI068 09/21/99 10/05/99 10/05/70TAL CYANIDE 001 MSD S 99LVI068 09/21/99 10/05/99 10/05/70TAL CYANIDE 001 MSD S 99LVI068 09/21/99 10/05/99 10/05/70TAL CYANIDE 001 MSD S 99LVI068 09/21/99 10/05/99 10/05/70TAL CYANIDE 001 MSD S 99LVI068 09/21/99 10/05/99 10/05/70TAL CYANIDE 001 MSD S 99LVI068 09/21/99 10/04/99 10/04/99 10/04/99	NITRATE BY IC	001 REP	S	99LIC083		10/04/99	10/04/99
TOTAL CYANIDE 001 S 99LC112A 09/21/99 10/06/99 10/06/7  TOTAL CYANIDE 001 REP S 99LC112A 09/21/99 10/06/99 10/06/7  TOTAL CYANIDE 001 MS S 99LC112A 09/21/99 10/06/99 10/06/7  TOTAL CYANIDE 001 MSD S 99LC112A 09/21/99 10/06/99 10/06/7  PHOSPHATE BY IC 001 S 99LIC083 09/21/99 10/04/99 10/04/7  PHOSPHATE BY IC 001 REP S 99LIC083 09/21/99 10/04/99 10/04/7  PHOSPHATE BY IC 001 MS S 99LIC083 09/21/99 10/04/99 10/04/7  PHOSPHATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/7  CHROMIUM VI 001 S 99LVI068 09/21/99 10/05/99 10/05/7  CHROMIUM VI 001 REP S 99LVI068 09/21/99 10/05/99 10/05/7  CHROMIUM VI 001 MS S 99LVI068 09/21/99 10/05/99 10/05/7  CHROMIUM VI 001 MS S 99LVI068 09/21/99 10/05/99 10/05/7  CHROMIUM VI 001 MSD S 99LVI068 09/21/99 10/05/99 10/05/7  SULFATE BY IC 001 S 99LICA83 09/21/99 10/04/99 10/04/9	NITRATE BY IC	001 MS	S	99LIC083	09/21/99	10/04/99	10/04/99
TOTAL CYANIDE 001 REP S 99LC112A 09/21/99 10/06/99 10/06/7  TOTAL CYANIDE 001 MS S 99LC112A 09/21/99 10/06/99 10/06/7  TOTAL CYANIDE 001 MSD S 99LC112A 09/21/99 10/06/99 10/06/7  PHOSPHATE BY IC 001 S 99LIC083 09/21/99 10/04/99 10/04/7  PHOSPHATE BY IC 001 MS S 99LIC083 09/21/99 10/04/99 10/04/7  PHOSPHATE BY IC 001 MS S 99LIC083 09/21/99 10/04/99 10/04/7  PHOSPHATE BY IC 001 MS S 99LIC083 09/21/99 10/04/99 10/04/7  CHROMIUM VI 001 S 99LVI068 09/21/99 10/05/99 10/05/7  CHROMIUM VI 001 MS S 99LVI068 09/21/99 10/05/99 10/05/7  CHROMIUM VI 001 MS S 99LVI068 09/21/99 10/05/99 10/05/7  CHROMIUM VI 001 MS S 99LVI068 09/21/99 10/05/99 10/05/7  CHROMIUM VI 001 MS S 99LVI068 09/21/99 10/05/99 10/05/7  SULFATE BY IC 001 S 99LICA83 09/21/99 10/04/99 10/04/9	NITRATE BY IC	001 MSD	S	99LIC083	09/21/99	10/04/99	10/04/99
TOTAL CYANIDE 001 MS S 99LC112A 09/21/99 10/06/99 10/06/97  TOTAL CYANIDE 001 MSD S 99LC112A 09/21/99 10/06/99 10/06/99  PHOSPHATE BY IC 001 S 99LIC083 09/21/99 10/04/99 10/04/99  PHOSPHATE BY IC 001 MS S 99LIC083 09/21/99 10/04/99 10/04/99  PHOSPHATE BY IC 001 MS S 99LIC083 09/21/99 10/04/99 10/04/99  PHOSPHATE BY IC 001 MSD S 99LIC083 09/21/99 10/04/99 10/04/99  CHROMIUM VI 001 S 99LV1068 09/21/99 10/05/99 10/05/99  CHROMIUM VI 001 MS S 99LV1068 09/21/99 10/05/99 10/05/99  CHROMIUM VI 001 MS S 99LV1068 09/21/99 10/05/99 10/05/99  CHROMIUM VI 001 MSD S 99LV1068 09/21/99 10/05/99 10/05/99  SULFATE BY IC 001 S 99LICA83 09/21/99 10/04/99 10/04/99	TOTAL CYANIDE	001	S	99LC112A	09/21/99	10/06/99	10/06/99
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SULFATE BY IC 001 S 99LICA83 09/21/99 10/04/99 10/04/	CHROMIUM VI	001 MS	S	99LVI068	09/21/99	10/05/99	10/05/99
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CITENTE BY TO 001 DED C 001 TCN02 00/01/00 10/04/00 10/04	SULFATE BY IC	001		99LICA83	09/21/99	10/04/99	10/04/99
	SULFATE BY IC	001 REP	S	99LICA83	09/21/99	10/04/99	10/04/99
SULFATE BY IC 001 MS S 99LICA83 09/21/99 10/04/99 10/04/	SULFATE BY IC	001 MS	S	99LICA83	09/21/99	10/04/99	10/04/99
	SULFATE BY IC	001 MSD		99LICA83	09/21/99	10/04/99	10/04/99
NITRATE NITRITE 001 S 99LN3D47 09/21/99 09/30/99 10/01/	NITRATE NITRITE	001	S	99LN3D47	09/21/99	09/30/99	10/01/99

# Recra LabNet - Lionville Laboratory INORGANIC ANALYTICAL DATA PACKAGE FOR TNU-HANFORD B99-078

DATE RECEIVED: 09/23/99 RFW LOT # :9909L166

CLIENT ID /ANALYSIS	RFW #	XTM	PREP #	COLLECTION	EXTR/PREP	ANALYS <b>IS</b>
	· · · · · · · · · · · · · · · · · · ·					
NITRATE NITRITE	001 REP	S	99LN3D47	09/21/99	09/30/99	10/01/99
NITRATE NITRITE	001 MS	S	99LN3D <b>47</b>	09/21/99	09/30/99	10/01/99
NITRATE NITRITE	001 MSD	S	99LN3D47	09/21/99	09/30/99	10/01/99
AMMONIA	001	S	99LAM038	09/21/99	10/12/99	10/12/99
AMMONIA	001 REP	S	99LAM050	09/21/99	12/28/99	12/29/99
AMMONIA	001 MS	S	99LAM050	09/21/99	12/28/99	12/29/99
PH	001	S	99LPH105	09/21/99	10/01/99	10/01/99
PH	001 REP	S	99LPH105	09/21/99	10/01/99	10/01/99
SULFIDE	001	S	99LSD051	09/21/99	09/29/99	09/30/99
SULFIDE	001 REP	S	99LSD051	09/21/99	09/29/99	09/30/99
SULFIDE	001 MS	S	99LSD051	09/21/99	09/29/99	09/30/99
SULFIDE	001 MSD	S	99LSD051	09/21/99	09/29/99	09/30/99
AR OC.						

LAB QC:

MB1	S	99LIC083	N/A	10/04/99	10/04/99
MB1 BS	S	99LIC0 <b>83</b>	N/A	10/04/99	10/04/99
MB1	S	99LIC083	N/A	10/04/99	10/04/99
MB1 BS	S	99LIC083	N/A	10/04/99	10/04/99
MB1	S	99LIC083	N/A	10/04/99	10/04/99
MB1 BS	S	99LIC0 <b>83</b>	N/A	10/04/99	10/04/99
MBl	S	99LIC0 <b>83</b>	N/A	10/04/99	10/04/99
MB1 BS	S	99LIC083	N/A	10/04/99	10/04/99
LC1 L	S	99LC112A	N/A	10/06/99	10/06/99
LC2 L	S	99LC112A	N/A	10/06/99	10/06/99
MB1	S	99LC112A	N/A	10/06/99	10/06/99
MB1	S	99LIC083	N/A	10/04/99	10/04/99
MB1 BS	S	99LIC083	N/A	10/04/99	10/04/99
MB1	S	99LVI068	N/A	10/05/99	10/05/99
MB1 BS	S	99LVI068	N/A	10/05/99	10/05/99
MB1 BSD	S	99LVI068	N/A	10/05/99	10/05/99
MB1	S	99LICA83	N/A	10/04/99	10/04/99
MB1 BS	S	99LICA83	N/A	10/04/99	10/04/99
MB1	S	99LN3D47	N/A	09/30/99	10/01/99
MB1 BS	S	99LN3D47	N/A	09/30/99	10/01/99
MB1 BSD	S	99LN3D47	N/A	09/30/99	10/01/99
MB1	S	99LAM038	N/A	10/12/99	10/12/99
MB1 BS	S	99LAM038	N/A	10/12/99	10/12/99
	MB1 BS MB1 MB1 BS MB1 MB1 BS MB1 MB1 BS LC1 L LC2 L MB1 MB1 BS MB1 MB1 BS MB1 MB1 BS MB1 MB1 BS MB1 MB1 BS MB1 MB1 BS MB1 MB1 BS MB1 MB1 BS MB1 MB1 BS MB1 MB1 BS MB1	MB1       BS       S         MB1       BS       S         MB1       BS       S         MB1       BS       S         MB1       BS       S         LC1       L       S         LC2       L       S         MB1       S       S         MB1       BS       S         MB1       S       S         MB1       S       S         MB1       S       S         MB1       S       S <td>MB1       BS       S       99LIC083         MB1       S       99LIC083         MB1       BS       S       99LIC083         MB1       BS       S       99LIC083         MB1       BS       S       99LIC083         MB1       BS       S       99LIC083         LC1       L       S       99LC112A         LC2       L       S       99LC112A         MB1       S       99LIC083         MB1       BS       S       99LIC083         MB1       S       99LVI068         MB1       BS       S       99LVI068         MB1       BS       S       99LICA83         MB1       BS       &lt;</td> <td>MB1         BS         S         99LIC083         N/A           MB1         S         99LIC083         N/A           MB1         BS         S         99LIC083         N/A           MB1         S         99LIC083         N/A           MB1         S         99LIC083         N/A           MB1         S         99LIC083         N/A           MB1         S         99LC112A         N/A           MB1         S         99LC112A         N/A           MB1         S         99LC112A         N/A           MB1         S         99LIC083         N/A           MB1         S         99LIC083         N/A           MB1         S         99LV1068         N/A           MB1         S         99LV1068         N/A           MB1         S         99LV1068         N/A           MB1         S         99LICA83         N/A</td> <td>MB1       BS       S       99LIC083       N/A       10/04/99         MB1       S       99LIC083       N/A       10/04/99         MB1       BS       S       99LIC083       N/A       10/06/99         LC1       L       S       99LC112A       N/A       10/06/99         MB1       S       99LC112A       N/A       10/06/99         MB1       S       99LIC083       N/A       10/04/99         MB1       S       99LIC083       N/A       10/04/99         MB1       S       99LV1068       N/A       10/05/99         MB1       S       99LV1068       N/A       10/05/99         MB1       S       99LC083       N/A       10/04/99         MB1       S       99LV1068       N/A       10/05/99         MB1       S       99LV1068       N/A       10/04/99         MB1       S       99LN3D47       N/A</td>	MB1       BS       S       99LIC083         MB1       S       99LIC083         MB1       BS       S       99LIC083         MB1       BS       S       99LIC083         MB1       BS       S       99LIC083         MB1       BS       S       99LIC083         LC1       L       S       99LC112A         LC2       L       S       99LC112A         MB1       S       99LIC083         MB1       BS       S       99LIC083         MB1       S       99LVI068         MB1       BS       S       99LVI068         MB1       BS       S       99LICA83         MB1       BS       <	MB1         BS         S         99LIC083         N/A           MB1         S         99LIC083         N/A           MB1         BS         S         99LIC083         N/A           MB1         S         99LIC083         N/A           MB1         S         99LIC083         N/A           MB1         S         99LIC083         N/A           MB1         S         99LC112A         N/A           MB1         S         99LC112A         N/A           MB1         S         99LC112A         N/A           MB1         S         99LIC083         N/A           MB1         S         99LIC083         N/A           MB1         S         99LV1068         N/A           MB1         S         99LV1068         N/A           MB1         S         99LV1068         N/A           MB1         S         99LICA83         N/A	MB1       BS       S       99LIC083       N/A       10/04/99         MB1       S       99LIC083       N/A       10/04/99         MB1       BS       S       99LIC083       N/A       10/06/99         LC1       L       S       99LC112A       N/A       10/06/99         MB1       S       99LC112A       N/A       10/06/99         MB1       S       99LIC083       N/A       10/04/99         MB1       S       99LIC083       N/A       10/04/99         MB1       S       99LV1068       N/A       10/05/99         MB1       S       99LV1068       N/A       10/05/99         MB1       S       99LC083       N/A       10/04/99         MB1       S       99LV1068       N/A       10/05/99         MB1       S       99LV1068       N/A       10/04/99         MB1       S       99LN3D47       N/A

# Recra LabNet - Lionville Laboratory INORGANIC ANALYTICAL DATA PACKAGE FOR TNU-HANFORD B99-078

DATE RECEIVED: 09/23/99 RFW LOT # :9909L166

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
						<u> </u>
AMMONIA	MB1 BSD	S	99LAM038	N/A	10/12/99	10/12/99
AMMONIA	MB1	S	99LAM050	N/A	12/28/99	12/29/99
AIMOMMA	MB1 BS	S	99LAM050	N/A	12/28/99	12/29/99
AINOMMA	MB1 BSD	S	99LAM050	N/A	12/28/99	12/29/99
SULFIDE	MB1	S	99LSD051	N/A	09/29/99	09/30/99
SULFIDE	MB1 BS	S	99LSD0 <b>51</b>	N/A	09/29/99	09/30/99

RECRA	LabNat	Hea	Only
NECHA	Lauren	USE	UIIIY

# Custody Transfer Record/Lab Work Request Page \_\_\_of\_\_\_

9909L166

All FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS



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RECRA Project								V 0,01110		Solid	60 mL	250m						10ml				1			
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O - Oil A - Air	001	BOWBI							M-CI-951	ICOL	~						7	<u>v_</u>			/_	$\Delta$			
DS - Drum Solids		<del> </del>	<del></del>			<del> </del>	-				<del> </del>				<del></del>		-+			ļ	<del> </del>				
DL - Drum Liquids	· · ·	<del> </del>			<del></del>	├	<del> </del>				-			-		_	∤-						-+		
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WI - Wipe			· <del></del>			<del> </del>			<del>                                     </del>		<del> </del>			├											
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Bechtel Hanford	Inc.	C	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST								9-078-122	Page 1	of <u>1</u>
Collector Bowers/Trice	<del></del>		pany Contact ris Cearlock	Telepho 372-9		<del></del> -	F	roject Coord	instor	Price Code	8N	Data To	rnaround
Project Designation 200 Area Source characterizati	ion - 200-CW-1 OU	Samp	oling Location  D B pond (B8758) >15'			<del></del>	s	AF No. 399-078				45	Days
Ice Chest No. ERC	76-063	Field EL	Field Logbook No.  EL-1511  Method of Shipment Fed Ex										
Shipped To TMA/RECRA D # 9 - 4	01-99	Offsie	e Property No. A 990	2 le le	2		В	COA Ba	Air Bill N	1952	966	rf.	-
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POSSIBLE SAMPLE HAZAR	RDS/REMARKS		Preservation	Cool 4C	Cool 4C	None	Cooi 4C						
			Type of Container	aG	aG	aG	aG						
			No. of Container(s)	] - 1	l	1	1						
Special Handling and/or Stora	ge		Volume	60mL	250mL	250mL	500mL,		}	}			
	SAMPLE ANAL	YSIS		VOA - 8260A (TCL); VOA - 8260A (Add- On) {1- Propanol, Ethanol}	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (1) in Special Instructions.	See item (2). Special Instructions	}					
Sample No.	Matrix *	Sample Date	Sample Time		al alaga		G 92/23 w						4.26.35
OWBI2	Soil										·		
0WBT3	Soil	9-21-49	1250	χ	_ X_		Χ			Dom CA)			
OWBIAQ 1/9	Soil								<u></u>				
OVJBT5 G-21-99	Soil												
CHAIN OF POSSESSION	D. (/E	Sign/Prin		te/Time	See ci analyz	e for Np-237,	comments of isotopic U, N	on SAF B99-078 Ni-63, Tech-99, 1	ritium, . C	of ICP bottle	also	Matrix Soil Water	•
elinquished By 1045 Bow.	-21-99/1630 Date/Time	Received By Received By	/ / - 7 / 1 - 17 / Da	1630 te/Time	(1) G Gamn	amma Spectros 12 Spec - Add-1	scopy {Cesiu on {Americi	ım-137, Cobalt-6 um-241}; Stronti	0, Europiu <del>n</del> um-89,90	n-152, Europium Total Sr; Total i	-155); Uranium	Vapor Other Solid Other Liquid	· [
Hinquished By  Gice 9-27  Hinquished By	Date/Time	Received By FE	1. LL-()	1400 te/Time	(2) IC Seleni Vanad	P Metals - 601 um, Silver}; IC ium, Zinc}; M	0A (Supertra CP Metals - 6 ercury - 747	Isotopic Thorium ace) (Arsenic, B. 1010A (Supertrac 1 - (CV); Chromi	arium, Cadn e Add-On) ium Hex - 7	nium, Chromium (Beryllium, Cop 196	i, Lead,		
Fedex 933	99 0945	imu	mry 9.2399	0911S							Da	ate/Time	
SECTION  INAL SAMPLE Disposal Metho						Dispos	ed By				Da	ate/Time	
DISPOSITION DISPOSER MICHINA												<u> </u>	

#### Case Narrative

#### 1.0 GENERAL

Bechtel Hanford Inc. Sample Delivery Group H0541 is composed of one solid (soil) sample designated under SAF No. B99-078 with a Project Designation of: 200 Area Source characterization-200-CW-1 OU.

The sample was received as stated on the Chain-of-Custody document. Any discrepancies are noted on the TNU Sample Receipt Checklist. Results were transmitted to BHI via facsimile on November 15, 1999.

#### 2.0 ANALYSIS NOTES

# 2.1 Gamma Scan Analyses

No problems were encountered during the course of the analyses.

# 2.2 Total Strontium Analyses

No problems were encountered during the course of the analyses. A recount was performed on the QC blank.

#### 2.3 Americium-241 Analyses

No problems were encountered during the course of the analyses.

#### 2.4 Neptunium-237 Analyses

No problems were encountered during the course of the analyses.

# 2.5 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

# 2.6 Isotopic Thorium Analyses

No problems were encountered during the course of the analyses. A recount was performed on the duplicate. The RPD in the duplicate result and the original was 73%, greater than the allowable 3 sigma total of 68%. Both the original and duplicate results were less than the RDL.

# 2.7 Technetium-99 Analyses

No problems were encountered during the course of the analyses. Technetium-99 activity greater than the sample MDA but less than the RDL was detected in the QC blank.

#### 2.8 Total and Isotopic Uranium Analyses

Isotopic Uranium was to be ordered by BHI after reviewing data from the Total Uranium testing. No Isotopic Uranium analysis was requested. No problems were encountered during the course of the analyses.



# 2.9 Tritium Analyses

No problems were encountered during the course of the analyses.

# 2.10 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

SAMPLE DELIVERY GROUP H0541

SDG <u>7217</u> Contact Kevin C. Johnson

#### SAMPLE SUMMARY

Client Hanford Contract TRB-SBB-207925 Case no SDG H0541

CLIENT SAMPLE ID	LOCATION	MATRIX LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
BOWBT3	200 B pond (B8758) >15'	SOLID	N909164-01	B99-078	B99-078-122	09/21/99 12:50
Method Blank		SOLID	N909137-04	B99-078		
Lab Control Sample		SOLID	N909137-03	B99-078		
Duplicate (N909164-01)	200 B pond (B8758) >15'	SOLID	N909164-04	B99-078		09/21/99 12:50

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SAMPLE DELIVERY CROUP H0541

# QC SUMMARY

Client <u>Hanford</u>

Contract TRB-SBB-207925

Case no SDG H0541

QC BATCH	CHAIN OF	CLIENT SAMPLE ID	MATRIX	\$ SOLIDS	SAMPLE AMOUNT	BASIS	DAYS S		LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7214		Method Blank Lab Control Sample	SOLID SOLID				•		N909137-04 N909137-03	7214-004 7214-003
7217	B99-078-122	BOWBT3	SOLID	93.1	<del>-</del>		09/23/99	2	N909164-01	7217-001
		Duplicate (N909164-01)	SOLID	93.1			09/23/99	2	N909164-04	7217-004

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SDG <u>7217</u>

Contact Kevin C. Johnson

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS

Version 3.06

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SAMPLE DELIVERY GROUP H0541

SDG	7217		
Contact	<u>Kevin</u>	С.	Johnson

#### PREP BATCH SUMMARY

Client Hanford

Contract TRB-SBB-207925

Case no SDG H0541

			PREPARATION ERROR						- PLANCHETS ANALYZED -					
TEST	MATRIX	METHOD	ВАТСН	2σ <b>%</b>	CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG MS/ORIG	FIERS			
Alpha	Spectros	сору												
AM	SOLID	Americium 241 in Soil	6904-018	5.0	1			1	1	1/1				
NP	SOLID	Neptunium in Soil	6904-018	5.0	1			1	1	1/1				
PU	SOLID	Plutonium, Isotopic in Solids	6904-018	5.0	1			1	1	1/1	<del></del>			
TH	SOLID	Thorium, Isotopic in Soil	6904-018	5.0	1			1	1	1/1				
Beta	Counting													
SR	SOLID	Total Strontium in Soil	6904-018	10.0	1			1	1	1/1				
TC	SOLID	Technetium 99 in Soil	6904-018	10.0	1			1	1	1/1				
Gamma	Spectros	всору												
GAM	SOLID	Gamma Scan	6904-018	15.0	1			1	1	1/1				
Kinet	ic Phospl	norimetry												
U_T	SOLID	Uranium, Total in Soil	6904-018	9.0	1	<u>-</u> -		1	1	1/1	- <del></del> -			
Liqui	d Scinti	llation Counting												
H	SOLID	Tritium in Soil	6904-018	10.0	1			1	1	1/1				
NI_L	SOLID	Nickel 63 in Soil	6904-018	10.0	1			1	1	1/1				

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.

Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

PREP BATCH SUMMARY
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SAMPLE DELIVERY GROUP H0541

SDG 7217
Contact Kevin C. Johnson

#### WORK SUMMARY

Client <u>Hanford</u>

Contract <u>TRB-SBB-207925</u>

Case no <u>SDG H0541</u>

CLIENT SAMPLE ID		MATRIX	LAB SAMPLE ID	•		SUF-				
CUSTODY	SAF No		RECEIVED	PLANCHET	TEST	FIX	ANALYZED	REV1EWED	BY	METHOD
BOWBT3			N909164-01	7217-001	AM		11/10/99	11/15/99	NJV	Americium 241 in Soil
200 B pond (B	8758) >15'	SOLID	09/21/99	7217-001	GAM		11/03/99	11/15/99	VLN	Gamma Scan
B99-078-122	B99-078		09/23/99	7217-001	Н		10/27/99	11/15/99	NJV	Tritium in Soil
				7217-001	NI_L		11/11/99	11/15/99	NJV	Nickel 63 in Soil
				7217-001	NP		11/06/99	11/15/99	NJV	Neptunium in Soil
				7217-001	PU		11/10/99	11/15/99	NJV	Plutonium, Isotopic in Solids
				7217-001	SR		11/06/99	11/15/99	NJV	Total Strontium in Soil
				7217-001	TC		10/25/99	11/15/99	VUN	Technetium 99 in Soil
				7217-001	TH		11/02/99	11/15/99	NJV	Thorium, Isotopic in Soil
				7217-001	U_T		10/20/99	11/15/99	NJV	Uranium, Total in Soil
Method Blank			N909137-04	7214-004	AM		11/10/99	11/12/99	VLN	Americium 241 in Soil
		SOLID		7214-004	GAM		10/27/99	11/03/99	VŲN	Gamma Scan
	B99-078			7214-004	Н		10/28/99	11/03/99	VUИ	Tritium in Soil
				7214-004	NI_L		11/11/99	11/15/99	NJV	Nickel 63 in Soil
				7214-004	NP		11/08/99	11/12/99	NJV	Neptunium in Soil
				7214-004	PU		11/10/99	11/12/99	NJV	Plutonium, Isotopic in Solids
				7214-004	SR		11/10/99	11/12/99	NJV	Total Strontium in Soil
				7214-004	TC		10/27/99	11/03/99	NJV	Technetium 99 in Soil
				7214-004	TH		11/02/99	11/12/99	NJV	Thorium, Isotopic in Soil
				7214-004	<b>U_T</b>		10/18/99	11/03/99	NJV	Uranium, Total in Soil
Lab Control S	Sample		N909137-03	7214-003	MA		11/10/99	11/12/99	NJV	Americium 241 in Soil
	-	SOLID		7214-003	GAM		10/27/99	11/03/99	NJV	Gamma Scan
	B99-078			7214-003	н		10/27/99	11/03/99	ŊJV	Tritium in Soil
				7214-003	NI_L		11/11/99	11/15/99	NJV	Nickel 63 in Soil
				7214-003	NP		11/08/99	11/12/99	NJV	Neptunium in Soil
				7214-003	PU		11/10/99	11/12/99	NJV	Plutonium, Isotopic in Solids
				7214-003	SR		11/06/99	11/12/99	NJV	Total Strontium in Soil
				7214-003	TC		10/25/99	11/03/99	NJV	Technetium 99 in Soil
				7214-003	TH		11/02/99	11/12/99	NJV	Thorium, Isotopic in Soil
				7214-003	<b>u_</b> T		10/18/99	11/03/99	NJV	Uranium, Total in Soil

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SAMPLE DELIVERY GROUP H0541

SDG 7217
Contact Kevin C. Johnson

# WORK SUMMARY, cont.

Client Hanford
Contract TRB-SBB-207925

Case no <u>SDG H0541</u>

CLIENT SAMPL	E ID	MATRIX	LAB SAMPLE II COLLECTED	)		SUF-				
CUSTODY	SAF No		RECEIVED	PLANCHET	TEST	FIX	ANALYZED	REVIEWED	ву	метнор
Duplicate (N	1909164-01)		N909164-04	7217-004	AM		11/10/99	11/15/99	VLN	Americium 241 in Soil
200 B pond	B8758) >15'	SOLID	09/21/99	7217-004	GAM		10/29/99	11/15/99	NJV	Gamma Scan
	B99-078		09/23/99	7217-004	Н		10/28/99	11/15/99	VŲN	Tritium in Soil
				7217-004	NI_L		11/11/99	11/15/99	VUN	Nickel 63 in Soil
				7217-004	NP		11/06/99	11/15/99	VLN	Neptunium in Soil
				7217-004	PU		11/10/99	11/15/99	VUN	Plutonium, Isotopic in Solids
				7217-004	SR		11/06/99	11/15/99	NJV	Total Strontium in Soil
				7217-004	TC		10/26/99	11/15/99	VŲV	Technetium 99 in Soil
				7217-004	TH		11/04/99	11/15/99	NJV	Thorium, Isotopic in Soil
				7217-004	U_T		10/20/99	11/15/99	VŲN	Uranium, Total in Soil

TEST	SAF No	COUNTS OF	TESTS BY	SAMPLE TYPE  CLIENT MORE RI	E BLANK	LCS	DUP SPIKE	TOTAL
AM	B99-078	Americium 241 in Soil	AM/CMPLATE	1	1.	1	1	4
GAM	B99-078	Gamma Scan	GAMMAHI	1	1	1	1	4
н	B99-078	Tritium in Soil	EPA906.0	1	1	1	1	4
NI_L	B99-078	Nickel 63 in Soil	NI63LSC	1	1	1	1	4
NP	B99-078	Neptunium in Soil	NP237PLATE	1	1	1	1	4
PU	B99-078	Plutonium, Isotopic in Solids	PUPLATE	1	1	1	1	4
SR	B99-078	Total Strontium in Soil	SRTOTAL	1	1	1	1	4
TC	B99-078	Technetium 99 in Soil	TC99TRLSC	1	1	1	1	4
TH	B99-078	Thorium, Isotopic in Soil	THPLATE	1	1	1	1	4
U_T	B99-078	Uranium, Total in Soil	UKPA	1	1	1	1	4
TOTALS				10	10	10	10	40

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 Version
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# TMA/RICHMOND SAMPLE DELIVERY GROUP H0541

N909137-04

# METHOD BLANK

Method Blank

	og 7217 et <u>Kevin C. Johnson</u>	Client/Case no Contract	Hanford TRB-SEB-207925	SDG H0541
<u> </u>	id <u>N909137-04</u> id <u>7214-004</u>	Client sample id Material/Matrix SAF No		SOLID

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	0.024	0.050	0.084	400	U	н
Technetium 99	14133-76-7	1.50	0.22	0.48	15	J	TC
Neptunium 237	13994-20-2	0.021	0.028	0.021			NP
Total Uranium (ug/g)	7440-61-1	-0.001	0.002	0.005	1.0	U	U_T
Plutonium 238	13981-16-3	-0.013	0.10	0.19	1.0	U	PÜ
Plutonium 239/240	PU-239/240	0.025	0.076	0.16	1.0	U	PU
Nickel 63	13981-37-8	0.520	1.2	2.0	30	U	NI_L
Americium 241	14596-10-2	0.004	0.016	0.030	1.0	U	AM
Total Strontium	SR-RAD	-0.111	0.13	0.19	1.0	U	SR
Thorium 228	14274-82-9	-0.027	0.054	0.12	1.0	U	TH
Thorium 230	14269-63-7	-0.013	0.080	0.15	1.0	U	TH
Thorium 232	TH-232	0.013	0.027	0.051	1.0	U	TH
Potassium 40	13966-00-2	U		0.66		U	GAM
Cobalt 60	10198-40-0	U		0.042	0.050	U	GAM
Cesium 137	10045-97-3	υ		0.044	0.10	Ū	GAM
Europium 152	14683-23-9	υ		0.10	0.10	U	GAM
Europium 154	15585-10-1	U		0.11	0.10	U	GAM
Europium 155	14391-16-3	υ		0.091	0.10	U	GAM
Radium 226	13982-63-3	υ		0.076	0.10	U	GAM
Radium 228	15262-20-1	U		0.19	0.20	U	GAM
Thorium 228	14274-82-9	U		0.054		U	GAM
Thorium 232	TH-232	U	-	0.19		U	GAM
Americium 241	14596-10-2	U		0.098		U	GAM
Uranium 238	U-238	ប		4.3		U	GAM
Uranium 235	15117-96-1	U		0.14		U	GAM

200 Area Source chrctztn-200-CW-1 OU

QC-BLANK 32094

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SAMPLE DELIVERY CROUP H0541

N909137-03

#### LAB CONTROL SAMPLE

Lab Control Sample

SDG 7217 Contact Kevin C. Johnson	Client/Case no <u>Hanford</u> Case no <u>TRB-SRB-207925</u>	SDG H0541
Lab sample id <u>N909137-03</u>	Client sample id Lab Control Sample	
Dept sample id <u>7214-003</u>	Material/Matrix	<u> ŞOLID</u>
	SAF No <u>B99-078</u>	

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	4.89	0.15	0.084	400	J	н	4.84	0.19	101	83-117	80-120
Technetium 99	52.0	1.8	0.47	15	В	TC	5 <b>4</b> .1	2.2	96	84-116	80-120
Neptunium 237	11.0	0.65	0.049			NP	11.9	0.48	92	88-112	
Total Uranium (ug/g)	34.8	4.1	0.049	1.0		U_T	41.2	1.6	84	80-120	80-120
Plutonium 238	9.48	0.88	0.053	1.0		₽Ü	10.0	0.40	95	84-116	80-120
Plutonium 239/240	9.93	0.92	0.043	1.0		PU	10.6	0.42	94	84-116	80-120
Nickel 63	132	3.5	1.9	30		NI_L	134	5.4	99	84-116	
Americium 241	10.4	0.77	0.047	1.0		AM	10.5	0.42	9 <b>9</b>	85-115	80-120
Total Strontium	13.6	0.41	0.17	1.0		SR	12.4	0.50	110	82-118	
Thorium 230	22.5	1.1	0.16	1.0		TH	20.4	0.82	110	87-113	
Cobalt 60	1.36	0.066	0.029	0.050		GAM	1.49	0.060	91.	78-122	80-120
Cesium 137	1.44	0.056	0.035	0.10		GAM	1.54	0.062	94	77-123	80-120
							!				

200 Area Source chrctztn-200-CW-1 OU

QC-LCS 32093	

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N909164-04

# DUPLICATE

BOWBT3

SDG 7217		Client/Case no <u>Hanford</u> <u>SDG H0541</u>
Contact Kevin C. Johnson		Case no <u>TRB-SBB-207925</u>
DUPLICATE	ORIGIN <b>AL</b>	
Lab sample id <u>N909164-04</u>	Lab sample id <u>N909164-01</u>	Client sample id BOWBT3
Dept sample id <u>7217-004</u>	Dept sample id <u>7217-001</u>	Location/Matrix 200 B pend (B8758) >15' SOLID
	Received 09/23/99	Collected 09/21/99 12:50
% solids <u>93.1</u>	% solids <u>93.1</u>	Custody/SAF No <u>B99-078-122</u> <u>B99-078</u>

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	originaL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI- FIERS	RPD %	3σ TOT I	
Tritium	0.162	0.057	0.086	400	J	н	0.089	0.055	0.088	J	58	97	
Technetium 99	1.56	0.24	0.42	15	JB	TC	1.57	0.37	0.43	JB	1	47	
Neptunium 237	0	0.011	0.043		U	NP	0.017	0.034	0.081	U	-		
Total Uranium (ug/g)	0.334	0.038	0.005	1.0	J	U_T	0.380	0.043	0.005	J	13	31	
Plutonium 238	0	0.016	0.046	1.0	U	PU	-0.004	0.017	0.048	U	-		
Plutonium 239/240	0.012	0.033	0.055	1.0	U	PU	0	0.017	0.048	U	-		
Nickel 63	0.496	1.3	2.2	30	U	NI_L	0.198	1.2	2.0	U	-		
Americium 241	0.004	0.015	0.029	1.0	U	AM	0.015	0.015	0.029	U	-		
Total Strontium	0.046	0.12	0.20	1.0	υ	SR	0.029	0.12	0.20	U	-		
Thorium 228	0.793	0.19	0.13	1.0	J	TH	0.761	0.16	0.12	J	4	49	
Thorium 230	0.705	0.19	0.18	1.0	J	TH	0.328	0.13	0.14	J	_73	68	
Thorium 232	0.705	0.17	0.080	1.0	J	TH	0.713	0.14	0.049	J	1	48	
Potassium 40	11.2	0.95	0.49			GAM	7.82	1.6	1.2		36	44	
Cobalt 60	U		0.051	0.050	U	GAM	U		0.092	U	-		
Cesium 137	U		0.046	0.10	U	GAM	U		0.083	U	-		
Europium 152	υ		0.11	0.10	U	GAM	บ		0.22	U	-		
Europium 154	U		0.15	0.10	U	GAM	U		0.29	U	-		
Europium 155	U		0.089	0.10	U	GAM	ប		0.23	U	-		
Radium 226	0.431	0.099	0.098	0.10		GAM	0.354	0.15	0.18		20	76	
Radium 228	0.704	0.25	0.24	0.20		GAM	0.301	0.30	0,42	U	80	122	
Thorium 228	0.652	0.056	0.052			GAM	0.743	0.11	0.10		13	41	
Thorium 232	0.704	0.25	0.24			GAM	0.301	0.30	0.42	U	80	122	
Americium 241	U		0.11		U	GAM	ט		0.26	U	-		
Uranium 238	U		6.0		U	GAM	υ		10	U	-		
Uranium 235	υ		0.15		U	GAM	U		0.29	Ü	_		

200 Area Source chrctztn-200-CW-1 OU

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SAMPLE DELIVERY GROUP H0541

N909164-04

# DUPLICATE, cont.

BOWBT3

SDG 7217 Contact Kevin C. Johnson		Client/Case no <u>Hanford</u> SDG H05 <b>41</b> Case no TRB-SBB-207925
DUPLICATE	ORIGINAL	
Lab sample id N909164-04  Dept sample id 7217-004	Lab sample id N909164-01  Dept sample id 7217-001	Client sample id <u>BCWBT3</u> Location/Matrix 200 B pond (B8758) >15' SOLID
	Received 09/23/99	Collected 09/21/99 12:50_
% solids <u>93.1</u>	% solids <u>93.1</u>	Custody/SAF No <u>B99-078-122</u>

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Lab id <u>TMANC</u>

Protocol <u>Hanford</u>

Version <u>Ver 1.0</u>

Form <u>DVD-DUP</u>

Version <u>3.06</u>

Report date <u>11/15/99</u>

#### TMA/RICHMOND SAMPLE DELIVERY GROUP H0541

N909164-01

SDG <u>7217</u>

# DATA SHEET

Client/Case no Hanford SDG H0541 Contact Kevin C. Johnson Contract TRB-SBB-207925 Client sample id BOWBT3 Lab sample id <u>N909164-01</u> Dept sample id 7217-001 Location/Matrix 200 B pond (B8758) >15' SOLID

BOWBT3

Received 09/23/99 \_\_\_ Collected 09/21/99 12:50 % solids 93.1 Custody/SAF No B99-078-122 B99-078

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	0.089	0.055	0.088	400	J	Н
Technetium 99	14133-76-7	1.57	0.37	0.43	15	JB	TC
Neptunium 237	13994-20-2	0.017	0.034	0.081		U	NP
Total Uranium (ug/g)	7440-61-1	0.380	0.043	0.005	1.0	J	U_T
Plutonium 238	13981-16-3	-0.004	0.017	0.048	1.0	U	ÞŪ
Plutonium 239/240	PU-239/240	0	0.017	0.048	1.0	U	PÜ
Nickel 63	13981-37-8	0.198	1.2	2.0	30	U	$NI_L$
Americium 241	14596-10-2	0.015	0.015	0.029	1.0	U	AM
Total Strontium	SR-RAD	0.029	0.12	0.20	1.0	U	SR
Thorium 228	14274-82-9	0.761	0.16	0.12	1.0	J	TH
Thorium 230	14269-63-7	0.328	0.13	0.14	1.0	J	$\mathtt{TH}$
Thorium 232	TH-232	0.713	0.14	0.049	1.0	J	TH
Potassium 40	13966-00-2	7.82	1.6	1.2			GAM
Cobalt 60	10198-40-0	ប		0.092	0.050	U	GAM
Cesium 137	10045-97-3	U		0.083	0.10	U	GAM
Europium 152	14683-23-9	ប		0.22	0.10	U	GAM
Europium 154	15585-10-1	υ		0.29	0.10	U	GAM
Europium 155	14391-16-3	U		0.23	0.10	U	GAM
Radium 226	13982-63-3	0.354	0.15	0.18	0.10		GAM
Radium 228	15262-20-1	0.301	0.30	0.42	0.20	Ū	GAM
Thorium 228	14274-82-9	0.743	0.11	0.10			GAM
Thorium 232	TH-232	0.301	0.30	0.42		U	GAM
Americium 241	14596-10-2	υ		0.26		Ŭ	GAM
Uranium 238	U-238	ប		10		ប	GAM
Uranium 235	15117-96-1	U		0.29		U	GAM

200 Area Source chrctztn-200-CW-1 OU

DATA SHEETS Page 1 SUMMARY DATA SECTION Page 12

SAMPLE DELIVERY GROUP H0541

Test AM Matrix SOLID
SDG 7217
Contact Kevin C. Johnson

#### METHOD SUMMARY

AMERICIUM 241 IN SOIL
ALPHA SPECTROSCOPY

Client Hanford

Contract TRB-SPB-207925

Case no SDG H0541

# RESULTS

	LAB	RAW SUF-	Americ	um	
LIENT SAMPLE ID	SAMPLE ID	TEST FIX PLANCHET	241		
paration batch 6904-	018				,
ET3	N909164-01	7217-001	U		
JK (QC ID=32094)	N909137-04	7214-004	U		
S (QC ID=32093)	N909137-03	7214-003	ok		
plicate (N909164-01)	N909164-04	7217-004	-	U	

#### METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	raw Test	SUF- FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-	YIELD		COUNT min	FWHM keV		PREPARED	ANAL- YZED	DETECTOR
Preparation batch 6904-	018 2σ p	rep er	ror 5.	0 % Re	ference	Lab	Notebool	c 6904	pg.	018					
BOWBT3	N909164-01			0.029	0.500			79		765		50	11/08/99	11/10	SS-062
BLK (QC ID=32094)	N909137-04			0.030	0.500			78		793			11/08/99	11/10	SS-016
LCS (QC ID=32093)	N909137-03			0.047	0.500			73		793			11/08/99	11/10	SS-015
Duplicate (N909164-01)	N909164-04			0.029	0.500			78		769		50	11/08/99	11/10	SS-063
(QC ID=32222)															
Nominal values and limit	ts from meth	od		1.0	0.500			20-10	5	700	100	180			

	PROCEDURES	REFERENCE	AM/CMPLATE
		EP-060	Soil Preparation, rev 0
		EP-070	Soil Dissolution, rev 0
ļ		EP-940	Plutonium Purification, rev 0
		EP-960	Americium-Curium Purification, rev 0
		EP-008	Heavy Elements Electroplating, rev 0

AVERAGES ± 2 SD	MDA _	0.034	±	0.018
FOR 4 SAMPLES	AIETD -	77	±	5

METHOD SUMMARIES

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SUMMARY DATA SECTION

Page 13

SAMPLE DELIVERY GROUP H0541

| Test NP | Matrix | SOLID | | SDG | 7217 | | Contact | Kevin C. | Johnson | |

# METHOD SUMMARY

NEPTUNIUM IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract TRB-SRB-207925
Case no SDG H0541

# RESULTS

	LAB	RAW S	UF-	Neptuni	.um
CLIENT SAMPLE ID	SAMPLE ID	TEST F	IX PLANCHET	237	
Preparation batch 6904-	018				
BOWBT3	N909164-01		7217-001	ŭ	
BLK (QC ID=32094)	N909137-04		7214-004	0.021	
LCS (QC ID=32093)	N909137-03		7214-003	ok	
Duplicate (N909164-01)	N909164-04		7217-004	_	U

#### METHOD PERFORMANCE

	LAB	RAW	SUF-	MDA	VTIÖ	PREP	DILU-	Alerd	EFF	COUNT	FWHM	DRIFT	DAYS		ANAL-	
CLIENT SAMPLE ID	SAMPLE ID	TEST	FIX	pCi/g	g	FAC	TION	*	ł	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 6904-0	18 2σ pr	ep err	or 5.0	) <b>%</b> Re	eference	Lab	Notebool	c 6904	pg.	018				-	•	
BOWBT3	N909164-01			0.081	0.500			30		200			46	11/03/99	11/06	BETA
BLK (QC ID=32094)	N909137-04			0.021	0.500			30		200				11/03/99	11/08	BETA
LCS (QC ID=32093)	N909137-03			0.049	0.500			39		200				11/03/99	11/08	BETA
Duplicate (N909164-01)	N909164-04			0.043	0.500			38		200			46	11/03/99	11/06	BETA
(QC ID=32222)																
Nominal values and limit	s from metho	od			0.500			20-10	5	100		• •				

- 1			
	PROCEDURES	REFERENCE	NP237PLATE
		EP-060	Soil Preparation, rev 0
		EP-070	Soil Dissolution, rev 0
		EP-930	Neptunium Purification, rev 0

AVERAGES ± 2 SD	MDA	0.048	±	0.050
FOR 4 SAMPLES	YIELD	34	ŧ	10

METHOD SUMMARIES

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SUMMARY DATA SECTION

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SAMPLE DELIVERY GROUP H0541

# METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS
ALPHA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SIG H0541

#### RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX	PLANCHET	Pluto:		Pluto 239/		
Preparation batch 6904-0	)18							
BOWBT3	N909164-01		7217-001	U		U		
BLK (QC ID=32094)	N909137-04		7214-004	U		U		
LCS (QC ID=32093)	N909137-03		7214-003	ok		ok		
Duplicate (N909164-01)	N909164-04		7217-004	-	U	-	U	

# METHOD PERFORMANCE

Test PU Matrix SOLID

Contact <u>Kevin C. Johnson</u>

SDG <u>7217</u>

	LAB	RAW	SUF-	MAX MDA	QLIA	PREP	DILU-	Alerd	EFF	COUNT	FWHM	DRIFT	DAYS		ANAL-	
CLIENT SAMPLE ID	SAMPLE ID	TEST	FIX	pCi/g	g	FAC	TION	*	ક	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 6904-0	)18 2σ pr	ep er	ror 5.	0 % Re	ference	Lab	Notebool	c 6904	pg.	018						
BOWBT3	N909164-01			0.048	0.500			45		1246			50	11/09/99	11/10	SS-013
BLK (QC ID=32094)	N909137-04			0.19	0.500			24		795				11/09/99	11/10	SS-009
LCS (QC ID=32093)	N909137-03			0.053	0.500			53		760				11/09/99	11/10	SS-055
Duplicate (N909164-01)	N909164-04			0.055	0.500			46		1246			50	11/09/99	11/10	SS-014
(QC ID=32222)																
Nominal values and limit	s from metho	od		1.0	0.500			20-10	5	10	100		180			

PROCEDURES	REFERENCE	PUPLATE
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-940	Plutonium Purification, rev 0
	EP-008	Heavy Elements Electroplating, rev 0

AVERAGES ± 2 SD	MDA _	0.086	ŧ	0.14
FOR 4 SAMPLES	Alerp _	42	ŧ	25

METHOD SUMMARIES

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SUMMARY DATA SECTION

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SAMPLE DELIVERY CROUP H0541

| Test TH | Matrix SOLID | | SDG | 7217 | | Contact | Kevin C. Johnson | |

#### METHOD SUMMARY

THORIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client <u>Hanford</u>

Contract <u>TRB-SPB-207925</u>

Case no <u>SDG H0541</u>

#### RESULTS

PLE ID TEST FIX	PLANCHET	Thorium 228	Thorium 230	Thorium 232
164-01	7217-001	0.761 J	0.328 J	0.713 J
137-04	7214-004	U	U	U
137-03	7214-003		ok	
164-04	7217-004	ok J _	OUT J	ok J
	9164-01 9137-04 9137-03 9164-04	7214-004 72137-03 7214-003	7214-004 U 9137-03 7214-003	7214-004 U U 9137-03 7214-003 ok

#### METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MAX MI pCi/g	_		DILU- TION	YIELD			FWHM keV		PREPARED	ANAL YZED	DETECTOR
Preparation batch 6904-	018 2¢ pi	cep er	ror 5.	0 % F	Reference	Lab 1	Notebool	c 6904	pg.	018					
BOWBT3	N909164-01			0.14	0.250			92		772		42	11/01/99	11/02	SS-045
PLK (QC ID=32094)	N909137-04			0.15	0.250			87		783			11/01/99	11/02	SS-032
LCS (QC ID=32093)	N909137-03			0.16	0.250			86		783			11/01/99	11/02	SS-031
Duplicate (N909164-01) (QC ID=32222)	N909164-04			0.18	0,250			87		523		44	11/01/99	11/04	SS-027
Nominal values and limit	ts from metho	od		1.0	0.250	<u></u>		20-10	- <b></b>	200		 180			

	PROCEDURES	REFERENCE	THPLATE
		EP-000	Data Entry and Document Preparation, rev 0
ļ		EP-001	Q.C. Preparation, rev 0
,	i	EP-003	Tracing, rev 0
		EP-008	Heavy Elements Electroplating, rev 0
	,	EP-070	Soil Dissolution, rev 0
		RP-901	Thorium Purification - Small Aliquot, rev 0

AVERAGES ± 2 SD MDA 0.16 ± 0.034

FOR 4 SAMPLES YIELD 88 ± 5

METHOD SUMMARIES

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SUMMARY DATA SECTION

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SAMPLE DELIVERY GROUP H0541

Test <u>SR</u> Matrix <u>SOLID</u>

SDG <u>7217</u>

Contact <u>Kevin C. Jchnson</u>

#### METHOD SUMMARY

TOTAL STRONTIUM IN SOIL
BETA COUNTING

Client <u>Hanford</u>

Contract <u>TRB-SBB-207925</u>

Case no <u>SDG H0541</u>

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX	PLANCHET	Tot Stron	
Preparation batch 6904-	.018	<u> </u>			
BOWBT3	N909164-01		7217-001	U	
BLK (QC ID=32094)	N909137-04		7214-004	υ	
LCS (QC ID=32093)	N909137-03		7214-003	ok	
Duplicate (N909164-01)	N909164-04		7217-004	-	U

#### METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MAX MDA pCi/g	A ALIQ g	PREP FAC	DILU-	#			DRIFT KeV		PREPARED	ANAL- YZED	DETECTOR
Preparation batch 6904-0	018 2 <i>o</i> pi	rep er:	ror 1	0.0 % R	eference	Lab	Noteboo	k 690 <b>4</b>	pg.	018					
BOWBT3	N909164-01			0.20	1.00			85		200		46	11/05/99	11/06	GRB-202
BLK (QC ID=32094)	N909137-04			0.19	1.00			74		400			11/05/99	11/10	GRB-220
LCS (QC ID=32093)	N909137-03			0.17	1.00			81		400			11/05/99	11/06	GRB-219
Duplicate (N909164-01) (OC ID=32222)	N909164-04			0.20	1.00			83		200		46	11/05/99	11/06	GRB-203
Nominal values and limit	ts from metho	od.		1.0	1.00					100		180			

PROCEDURES	REFERENCE	SRTOTAL
	RP-500	Strontium - Initial Separation, rev 0
	RP-519	Strontium-89,90 Demounting and Yttrium
		Purification, rev 0

AVERAGES ± 2 SD	MDA	0.19_	±	0.028
FOR 4 SAMPLES	YIELD	81	±	10

METHOD SUMMARIES

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SUMMARY DATA SECTION

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SAMPLE DELIVERY GROUP H0541

# Test <u>TC</u> Matrix <u>SOLID</u> SDG <u>7217</u> Contact <u>Kevin C. Johnson</u>

#### METHOD SUMMARY

TECHNETIUM 99 IN SOIL
BETA COUNTING

Client <u>Hanford</u>

Contract <u>TRB-SBB-207925</u>

Case no <u>SDG H0541</u>

RESULTS

	LAB	RAW SUF-		Technet	ım	
CLIENT SAMPLE ID	SAMPLE ID	TEST FIX	PLANCHET	99		
Preparation batch 6904-	018					
BOWBT3	N909164-01		7217-001	1.57	Ţ	
BLK (QC ID=32094)	N909137-04		7214-004	1.50	Ţ	
LCS (QC ID=32093)	N909137-03		7214-003	ok		
Duplicate (N909164-01)	N909164-04		7217-004	ok	J	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST		MDA pCi/g	g QLLA	PREP FAC	DILU- TION	\$ YIELD			FWHM keV		PREPARED	ANAL- YZED	DETECTOR
Preparation batch 6904-	01 <b>8</b> 2σ pr	ep er:	ror 10	).0 % I	Reference	Lab :	Noteboo	<b>c</b> 690 <b>4</b>	pg.	018					
BOWBT3	N909164-01			0.43	1.02			78		101		34	10/21/99	10/25	GRB-230
BLK (QC ID=32094)	N909137-04			0.48	1,01			71		101			10/21/99	10/27	GRB-230
LCS (QC ID=32093)	N909137-03			0.47	1.01			73		101			10/21/99	10/25	GRB-220
Duplicate (N909164-01)	N909164-04			0.42	1.02			77		101		35	10/21/99	10/26	GRB-224
(QC ID=32222)															
Nominal values and limi	ts from metho	od		15	1.02			20-10	5	50		180	<del>,</del>		

PROCEDURES	REFERENCE	TC99TRLSC
	EP-060	Soil Preparation, rev 0
	EP-020	Sample Leach For Technetium-99, rev 0
	EP-540	Technetium-99 Purification, rev 0
L		

AVERAGES ± 2 SD MDA 0.45 ± 0.059

FOR 4 SAMPLES YIELD 75 ± 7

METHOD SUMMARIES

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 Lab id
 TMANC

 Protocol
 Hanford

 Version
 Ver 1.0

 Form
 DVD-CMS

 Version
 3.06

 Report date
 11/15/99

SAMPLE DELIVERY GROUP H0541

Test GAM Matrix SOLID SDG <u>7217</u>

Contact Kevin C. Johnson

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client <u>Hanford</u>

Contract TRB-SBB-207925

Case no SDG H0541

#### RESULTS

Preparation batch 6904-018	
BOWBT3 N909164-01 7217-001 U	U
BLK (QC ID=32094) N909137-04 7214-004 U	U
LCS (QC ID=32093) N909137-03 7214-003 ok	ok
Duplicate (N909164-01) N909164-04 7217-004 - U	- U

#### METHOD PERFORMANCE

	LAB	RAW SUF-	MAX MDA	ALIQ	PREP	DILU-	AlEPD	EFF	COUNT	FWIM	DRIFT	DAYS		ANAL-	
CLIENT SAMPLE ID	SAMPLE ID	TEST FIX	pCi/g	g	FAC	TION	*	¥	min	keV	KeV	HELL	PREPARED	ASED	DETECTOR
Preparation batch 6904-	318 2g nr	cep error 1	5 0 % Ref	erenc <b>e</b>	Lab N	int ebooi	k 6904	pg	018						<del></del>
вомвтз	N909164-01	op ortor 1.	0.22		2002		,,,	РЭ.	410			43	10/11/99	11/03	PD,03,00
BLK (QC ID=32094)	N909137-04		0.082 1	167					402				10/08/99	10/27	JR,03,00
LCS (QC ID=32093)	N909137-03		0.029 1	167					454				10/08/99	10/27	JR,04,00
Duplicate (N909164-01)	N909164-04		0.12	54.6					486			38	10/11/99	10/29	PD,04,00
(QC ID=32222)															
Nominal values and limit	ts from metho	od	0.050	55.0	-	···			100			180			

	PROCEDURES	REFERENCE	GAMMAHI
		EP-060	Soil Preparation, rev 0
		EP-100	Ge(Li) Preparation for Environmental Samples,
			rev 0
Į			

AVERAGES ± 2 SD MDA <u>0.11</u> ± <u>0.16</u> FOR 4 SAMPLES YIELD \_\_\_\_ ± \_\_\_

METHOD SUMMARIES Page 7 SUMMARY DATA SECTION

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Lab id TMANC

Protocol Hanford

Version <u>Ver 1.0</u>

Form DVD-CMS

Version 3.06

Report date <u>11/15/99</u>

SAMPLE DELIVERY GROUP H0541

# Test U T Matrix SOLID SDG 7217 Contact Kevin C. Johnson

#### METHOD SUMMARY

URANIUM, TOTAL IN SOIL
KINETIC PHOSPHORIMETRY

Client	Hanford
Contract	TRB-SRB-207925
Case no	SDG H0541

#### RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX PLANCHET	Total Uranium		
CHIERT SARPHE ID	OANT III II	1001 FIX FIRMCIDI	OT STITUM	 	
Preparation batch 6904-	018				
BOWBT3	N909164-01	7217-001	0.380 Ј		
BLK (QC ID=32094)	N909137-04	7214-004	ט		
LCS (QC ID=32093)	N909137-03	7214-003	ok		
Duplicate (N909164-01)	N909164-04	7217-004	ok J		

# METHOD PERFORMANCE

	LAB	RAW	SUF-	MDA	AL IQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS		ANAL-	
CLIENT SAMPLE ID	SAMPLE ID	TEST	FIX	ug/g	9	FAC	TION	*	¥	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 6904-0	018 2σ p:	rep er	ror 9.0	₹ R	eference	Lab	Notebool	c 6904	pg.	018	-		<b>-</b>			м.
BOMBI3	N909164-01			0.005	0.0500								29	10/20/99	10/20	KPA-001
BLK (QC ID=32094)	N909137-04			0.005	0.0500									10/18/99	10/18	KPA-001
LCS (QC ID=32093)	N909137-03			0.049	0.0500									10/18/99	10/18	KPA-001
Duplicate (N909164-01)	N909164-04			0.005	0.0500								29	10/20/99	10/20	KPA-001
(QC ID=32222)																
Nominal values and limit	s from metho	bo		1.0	0.0500								180			

	PROCEDURES	REFERENCE	UKPA
		EP-060	Soil Preparation, rev 0
ĺ		EP-070	Soil Dissolution, rev 0
		EP-044	Preparation of Total Uranium by Kinetic
			Phosphorimetry, rev 1
		EP-928	Total Uranium by Kinetic Phosphorimetry, rev 0

METHOD SUMMARIES

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SUMMARY DATA SECTION

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SAMPLE DELIVERY GROUP H0541

# 

# METHOD SUMMARY

TRITIUM IN SOIL

LIQUID SCINTILLATION COUNTING

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0541

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX	PLANCHET	Trit	ium
Preparation batch 6904-0	018				
BOWBT3	N909164-01		7217-001	0.08	9 J
BLK (QC ID=32094)	N909137-04		7214-004	U	
LCS (QC ID=32093)	N909137-03		7214-003	ok	J
Duplicate (N909164-01)	N909164-04		7217-004	ok	J

METHOD PERFORMANCE

	LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS		ANAL-	
CLIENT SAMPLE ID	SAMPLE ID	TEST	FIX	pCi/g	g	FAC	MOIT	*	¥	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 6904-0	18 2ø pr	ep err	or 10	.0 % R	eference	Lab	Noteboo)	6904	pg.	018						
BOWBT3	N909164-01			0.088	20.0			100		120			36	10/27/99	10/27	LSC-005
BLK (QC ID=32094)	N909137-04			0.084	20.3			100		120				10/27/99	10/28	LSC-005
LCS (QC ID=32093)	N909137-03			0.084	20.3			100		120				10/27/99	10/27	LSC-005
Duplicate (N909164-01)	N909164-04			0.086	20.2			100		120			37	10/27/99	10/28	LSC-005
(QC ID=32222)																
Nominal values and limit	s from metho	od.		400	20.0				-	25		,	180			

1	PROCEDURES	REFERENCE	EPA906.0
		EP-060	Soil Preparation, rev 0
		EP-211	Tritium in Solid Samples by Azeotropic
			Distillation, rev 0

AVERAGES ± 2 SD	MDA 0.086 ± 0.004
FOR 4 SAMPLES	YIELD 100 ± 0

METHOD SUMMARIES

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SUMMARY DATA SECTION

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SAMPLE DELIVERY GROUP H0541

# | Test NI L | Matrix SOLID | | SDG | 7217 | | Contact | Kevin C. Johnson | |

#### METHOD SUMMARY

NICKEL 63 IN SOIL LIQUID SCINTILLATION COUNTING

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0541

#### RESULTS

	LAB	RAW SUF-			
CLIENT SAMPLE ID	SAMPLE ID	TEST FIX	PLANCHET	Nicke:	1 63
Preparation batch 6904-	018			· ·	
BOWBT3	N909164-01		7217-001	υ	
BLK (QC ID=32094)	N909137-04		7214-004	U	
LCS (QC ID=32093)	N909137-03		7214-003	ok	
Duplicate (N909164-01)	N909164-04		7217-004	-	U

# METHOD PERFORMANCE

	LAB	RAW	SUF- MD	QIJA A	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS		ANAL-	
CLIENT SAMPLE ID	SAMPLE ID	TEST	FIX pCi/	g g	FAC	TION	*	*	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 6904-0	018 2σ pi	rep err	or 10.0 %	Reference	Lab	Notebool	6904	pg.	018	•		•			
BOWBT3	N909164-01		2.0	0.500			89		100			51	11/10/99	11/11	LSC-005
BLK (QC ID=32094)	N909137-04		2.0	0.500			92		100				11/10/99	11/11	LSC-005
LCS (QC ID=32093)	N909137-03		1.9	0.500			95		100				11/10/99	11/11	LSC-005
Duplicate (N909164-01)	N90 <b>9164-04</b>		2.2	0.500			83		100			51	11/10/99	11/11	LSC-005
(QC ID=32222)															
N-1-111 11-1				0 500											
Nominal values and limit	s from metho	σα	30	0.500					10			180			

PROCEDURES	REFERENCE	NI63LSC
	EP-060	Soil Preparation, rev 0
	EP-431	Nickel-63 Purification, rev 0

AVERAGES ± 2 SD	MDA	2.0	±	0.25
FOR 4 SAMPLES	YIELD	90	±	10

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SUMMARY DATA SECTION
Page 22

Lab id <u>TMANC</u>

Protocol <u>Hanford</u>

Version <u>Ver 1.0</u>

Form <u>DVD-CMS</u>

Version <u>3.06</u>

Report date <u>11/15/99</u>

		*											•
Bechtel Hanford I	nc.	C	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUES							В99	-078-122	Page <u>1</u>	of <u>1</u>
Collector Bowers/Trice			any Contact is Cearlock	Telepho 372-9		<u></u>		Project Coordi	nator	Price Code	8N	Data Tui	rnaround
Project Designation 200 Area Source characterizati	on - 200-CW-LOU	Samp	Sampling Location   SAF No.   200 B pond (B8758) > 15'   B99-078									45	Days
		Field	Logbook No.					Method of Ship	oment				
Shinned To	+7		-1511 e Property No.		<u>.                                    </u>			Fed Ex Bill of Lading/	Air Bill N	0			
Shipped To TMATECRA DFD 9-6	31-79	0	A99026	,5						7952	96	15	
								COA B2					
POSSIBLE SAMPLE HAZAR	DS/REMARKS		Preservation	Cool 4C	Cool 4C	None	Cool 40						
			Type of Container	aG	aG	aG	aG						
			No. of Container(s)	1	1	1	1						
Special Handling and/or Stora	ge		Volume	60mL	250mL	250mL	500mL	•					
	SAMPLE ANAI	YSIS		VOA - 8260A (TCL); VOA - 8260A (Add- On) (1- Propanol, Ethanol)	Semi-VOA - 8270A (TCL) TPH-Diesel Range- WTPH-D; PCBs - 8082	Instructions.	See item (2 Special Instructio						
Sample No. 21/3	Matrix •	Sample Date	Sample Time	<b>对手抓在</b> 。	<b>沙花为</b> 的	<b>新教育技术</b>	SP WAS	41 200 250	1889		N. C. C.	(Q. j.) (A)	
BOWBT2	Soil												
вомвтз	Soil	9-21-29	7 1250			$\perp_{X}$	ļ			Dowca)	,		-
BOWBTA -1/3	Soil			ļ		ļ <u>.</u>							<u> </u>
BONYBT5 G-2/-99	Soil				ļ		ļ <u>.</u>		-		<del> </del>		<del> </del>
CHAIN OF POSSESSION  Relinquished By Doug Boure  Relinquished By  Relinquished By  Relinquished By  Relinquished By  Relinquished By  Relinquished By	Date/Time  Date/Time  Date/Time	Received By	9 9-31-89/1 9 9 22/99 X 9 122 99	ate/Time  6 3 S ato/Time  1 0 O ate/Time  14 0 O ate/Time  7 33 - 4	See anal anal (1) Gan (Ur. (2) Sele Van	yze for Np-237, yze for NO2/NO Gamma Spectro mma Spec - Add anium}; Isotopi ICP Metals - 60 mium, Silver}; I adium, Zinc}; N	y comments, isotopic U O3, IC anio oscopy (Ce I-on (Americ o Plutonium 010A (Supe ICP Metals Mercury - 7	NS s on SAF B99-071 , Ni-63, Tech-99, ns, Sulfides, Amn sium-137, Cobalt- icium-241); Stron n; Isotopic Thoriu intrace) {Arsenic, - 6010A (Supertr. 471 - (CV); Chron	Tritium, nonia, Total 60, Europiu tium-89,90 m {Thorium Barium, Cac ace Add-On mium Hex -	Out of ICP bottle Cyanide, and pH im-152, Europiun Total Sr; Total i-232}; Americiu Imium, Chromiun ) {Beryllium, Co 7196	also I. n-155}; Uranium m-241 m, Lead,	Matrix Soil Water Vapor Other Solid Other Liqui	
LABORATORY Received By	-23-99 16in	yux	- 0 (00) (3)	Ti	tle						Ţ	Date/Time	
SECTION  FINAL SAMPLE Disposal Me	thod	<u></u>		<del></del>		Disp	osed By			· · · <del>-</del>	1	Date/Time	·
DIEBOCETION													

# SAMPLE RECEIPT CHECKLIST

	SAMPLE RECEIPT
Client:	Bealited Hanford Date/Time received 9-23-79 11:00
CoC No	D. 899-078-122
Contair	ner I.D. No. SML-579 Requested TAT (Days) 45 P.O. Received Yes [ ] No [c]
	A INSPECTION
1.	Custody seals on shipping container intact? Yes [L] No [ ] N/A [ ]
2.	Custody seals on shipping container dated & signed? Yes [ L ] No [ ] N/A [ ]
3.	Custody seals on sample containers intact?  Yes [ No [ ] N/A [ ]
4.	Custody seals on sample containers dated & signed? Yes No [ ] N/A [ ]
5.	Cooler Temperature: Packing material is: Wet [ ] Dry [11]
6.	Number of samples in shipping container:
7.	Number of containers per sample: (Or see CoC)
8.	Paperwork agrees with samples?  Yes [ No [ ]
9.	Samples have: Tape [ ] Hazard labels [ ] Rad labels [ HAppropriate sample labels [ ]
10.	Samples are: In good condition [ Leaking [ ] Broken Container [ ] Missing [ ]
11.	Describe any anomalies:
13.	Was P.M. notified of any anomalies? Yes [ ] No [ ] Date
14.	Received by McCore Date: 7-23-99 Time: 11:00
	LOGIN
TNU	W.O. No. Group No. Client W.O. No.
	PROGRAM MANAGER
Samp	le holding times exceeded?  Yes [ ] No [ ]
Client	Notified: Name Date/time